UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R042XD004NM

Site Name: Limy

Precipitation or Climate Zone: 12-14 inches

Phase:

PHYSIOGRAPHIC FEATURES

Narrative:

This site occurs on gently sloping inset fans. Slopes range from 0 to 5 percent. Elevations range from approximately 4700 to 6000 feet above sea level.

Land Form:

1. Inset fans on fan piedmonts
2.
3.

Aspect:

1. No influence on this site
2.
3.

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

Flooding:	**Minimum**	**Maximum**
Frequency	None	**None**
Duration	None	**None**

Ponding:	**Minimum**	**Maximum**
Depth (inches)	None	**None**
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 and well drained. There is a calcic horizon within 20 inches of the surface. The surface textures are fine sandy loam, and very fine sandy loam. The underlying layers may be sandy clay loam, clay loam, or silt loam. Permeability is moderately slow and available water holding capacity is moderate. Because of the high lime content and surface textures, the soils are easily eroded if not protected by adequate vegetation.

Parent Material Kind: Alluvium
Parent Material Origin: Limestone

Surface Texture:

1. Fine sandy loam
2. Very fine sandy loam
3.

Surface Texture Modifier:

1. None
2.
3.

Subsurface Texture Group: Loamy
Surface Fragments <=3" (% Cover): 0
Surface Fragments >3" (% Cover): 0
Subsurface Fragments <=3" (%Volume): 9
Subsurface Fragments <=3" (%Volume): 0

	Minimum	Maximum
Drainage Class:	Well Drained	Well Drained
Permeability Class:	Moderately slow	Moderately slow
Depth (inches):	60	>60
Electrical Conductivity (mmhos/cm):	0	2
Sodium Absorption Ratio:		
Soil Reaction (1:1 Water):	7.9	8.4
Soil Reaction (0.1M CaCl2):		
Available Water Capacity (inches):	6	7
Calcium Carbonate Equivalent (percent):	0	40

PLANT COMMUNITIES

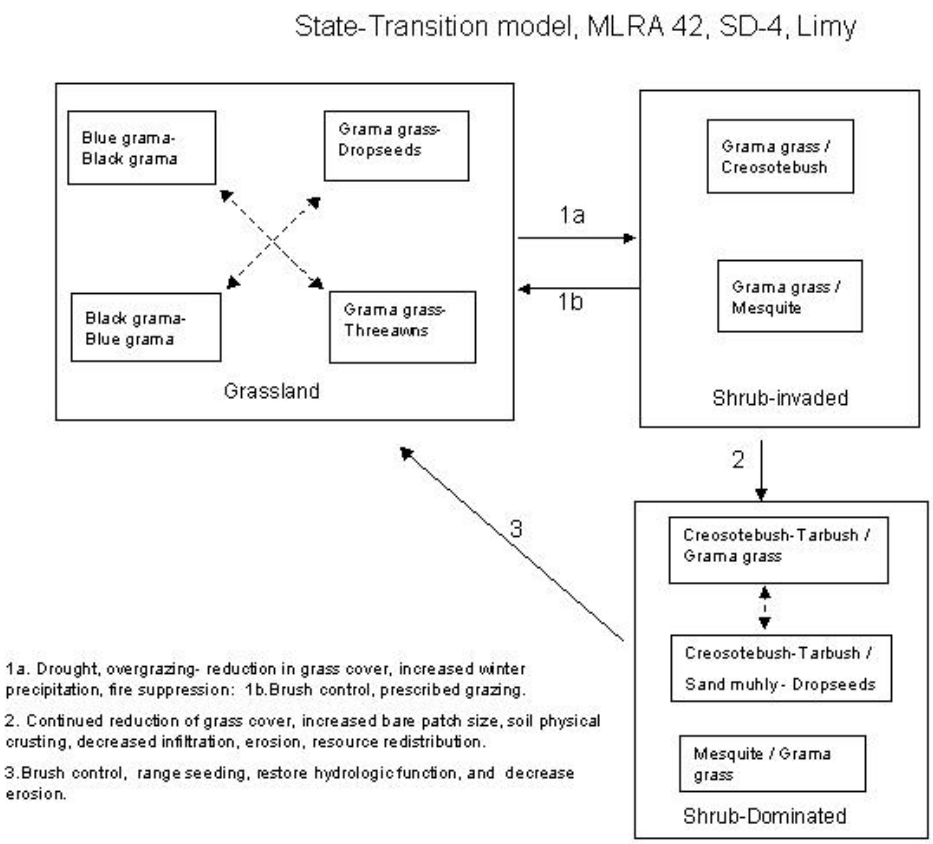
Ecological Dynamics of the Site:

Overview

The Limy ecological site occurs as a component associated with both the shallow sandy and loamy ecological sites. When the Limy site occurs with the shallow sandy site, the Limy site occupies a lower slightly concave or bottom (inset fan) position of the piedmont slope, whereas the Shallow Sandy site is situated on the more convex side slopes or the top position of the piedmont slope. Where the Limy site and the Loamy site occur together, they intergrade and form a mosaic where there is no apparent distinction in landscape position.

The aspect of this site is open grassland sparsely dotted with shrubs. Blue grama and black grama are the dominant species. Forb production and composition can fluctuate widely from year to year. Some of the more common forbs include grassland croton and bladderpod. Characteristic shrubs include winterfat, soaptree yucca, and prickly pear. This site is subject to invasion by mesquite, and also creosotebush and or tarbush. Drought, overgrazing, or a combination of the two can initiate the transition from grassland to a shrub-invaded state. Above average winter precipitation may also favor the encroachment of shrubs[4]. Seed dissemination by wildlife and livestock can aid in the establishment of mesquite. Fire suppression may also play a part by allowing mesquite seedlings to survive and flourish.[1] Creosotebush invasion may be facilitated by proximity to areas where creosotebush is already established. Once mesquite or creosotebush is established, prescribed grazing may be necessary to alter the path to shrub dominance. Continued loss of grass cover, decreased infiltration, and erosion produce conditions conducive to shrub dominance.

Plant Communities and Transitional Pathways (diagram)



MLRA 42; SD-4; Limy

Grassland State

- Blue grama – Black grama community with few scattered soaptree yucca
- Grass cover high
- Annesa fine sandy loam, Fort Bliss Soil Survey, Otero Co.

Shrub Invaded State

- Blue grama – Black grama / Mesquite
- Grass cover moderate, bare patches evident, physical soil crusts
- Annesa fine sandy loam, Fort Bliss Soil Survey, Otero Co.

Shrub Dominated State

- Creosotebush /grama grass
- Grass cover low, bare patches evident and expanding with increase in shrub cover
- Annesa fine sandy loam, Fort Bliss Soil Survey, Otero Co.

State Containing Historic Climax Plant Community

Grassland: This state is currently the most common on Limy sites of SD-4. Blue grama and black grama are the dominant species, with a fair amount of sand muhly and vine mesquite distributed throughout the site. Blue grama generally has the highest production with black grama second. Forage preference can shift production in favor of black grama and vice versa depending on factors such a season of use, stocking rate, and livestock distribution. Dropseeds or threeawns species can increase in response to a decrease in grama grass cover. This decrease in cover may be climate or grazing induced. Shrubs associated with this state include winterfat, soaptree yucca, fourwing saltbush, prickly pear and cholla. Winterfat is a signature or key species of the limy site. A lack of or decrease in winterfat is usually grazing induced. Colonies of soaptree yucca appear scattered throughout the Armesa soil series of the Limy site. These groups or heavier densities of yucca may be due to slight soil differences. Broom snakeweed comes and goes in cycles, increasing following increased winter precipitation. This site is susceptible to invasion by mesquite, creosotebush and or tarbush.

Diagnosis: Blue grama and black grama are the dominant species. Grass cover is uniformly distributed with few large bare areas. There is little evidence of active rills and gully formation. Litter movement is limited to smaller size class litter and short distances. Creosotebush, tarbush and mesquite are absent.

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	575	930	1120
Forb	55	50	60
Tree/Shrub/Vine	20	20	20
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	BOGR2	Blue grama	400-500	400-500
2	BOER4	Black grama	200-250	200-250
3	MUAR2	Sand muhly	50-75	75-100
3	PAOB	Vine mesquite	50-75	
3	PAHA	Halls's panicum	15-30	
3	SPCR	Sand dropseed	15-30	
4	PLMU3	Tobosa	45-60	45-60
4	SPAI	Alkali sacaton	45-60	
4	SCBR2	Burrograss	45-60	
4	ARIST	Threeawn	45-60	
4	SEVU2	Plains bristlegrass	15-30	
5	NENE5	New Mexico feathergrass	10-20	10-20

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
6	2FA	Annual forb	5-10	5-10
7	2FP	Perennial forb	5-10	5-10
8	CROTO	Croton	10-20	10-20
8	LESQU	Bladderpod	10-20	
9	ACNA2	Desert holly (dwarf desert peony)	5-10	5-10
9	SOEL	Silverleaf nightshade	5-10	
9	THAC	Pricklyleaf dogweed	5-10	

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
10	KRLA2	Winterfat	5-10	5-10
10	ATCA2	Fourwing saltbush	5-10	
11	YUEL	Soaptree yucca	5-10	5-10
11	GUSA2	broom snakeweed	3-5	
11	OPSP2	Cholla	3-5	
11	OPUNT	Pricklypear	3-5	
11	EPHRD	Ephedra	3-5	

Plant Type - Lichen

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Moss

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Microbiotic Crusts

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Growth Curves

Growth Curve ID 5804

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 State This state is characterized by the invasion of mesquite, creosotebush or tarbush. However, grasses (blue grama and black grama) are still dominant species. Shrub cover varies from just a few widely scattered individuals to approaching co-dominance with grasses. As shrub cover increases herbaceous cover correspondingly decreases, due to resource competition. The majority of mesquite-invaded sites on Armesa soils tend to originate near roads or livestock water facilities. Creosotebush and tarbush are more common on the Armesa soils when they are adjacent to gravelly, loamy or other sites already containing creosotebush or tarbush.

Diagnosis: Production is usually reduced from grassland state. Creosotebush, tarbush or mesquite is present. Grass cover varies from near grassland conditions to patchy, with bare areas present and usually larger around invading shrubs.

Transition to Shrub Invaded (1a): A reduction in grass cover may facilitate the establishment of shrub seedlings. This reduction in cover may be climate or grazing induced. Drought can reduce forage production by more than 50 percent[3]. Black grama cover may be reduced during extended periods of drought regardless of grazing intensity, however, increases following drought are greatest under conservative grazing[2]. Wildlife and livestock disperse mesquite seed. Creosotebush and tarbush seed is dispersed by wind, wildlife or road maintenance equipment. Periods of climate with above average winter precipitation and dry summers may favor shrub establishment[4]. Fire suppression may aid shrub seedling establishment.[5]

Key indicators of approach to transition:

- Decrease or change in distribution of grass cover and increase in amount of bare ground.
- Appearance of shrub seedlings.
- Evidence of litter movement—indicating loss or redistribution of organic matter.
- Formation of physical crusts—indicating loss of organic matter and decrease in soil aggregate stability and reduced infiltration.

Transition back to Grassland (1b) Brush management is necessary to remove shrubs and increase grass cover. Allow natural revegetation. Prescribed grazing will help ensure proper forage utilization, and increase organic matter and infiltration.

Shrub Dominated State This state is characterized by the dominance of shrubs and loss of grass cover. Grass cover is minimal for the site, and seems to be lowest when dominated by creosotebush. Dropseeds and sand muhly establish readily from seed and may become the dominant grasses. Grasses form small disconnected patches scattered across the site with a few of the hardier individuals occupying otherwise bare areas between shrubs. Shrub cover is variable, but can be very dense. Shrub densities tend to increase along a gradient on some areas; on others shrub densities are fairly uniform.

Diagnosis: Grass production is minimal for site potential. Shrub cover is high, exceeding that of grasses. Erosion is apparent and rills or gullies may be present. Physical crusts are present in bare areas and biotic crusts are present around shrubs and in bare areas.

Transition to Shrub Dominated (1a) Extended periods of above average winter precipitation may favor shrub expansion. Continued overgrazing especially when coupled with drought will severely reduce grass cover promoting increased shrub densities. Prescribed fire may be lost as a management option if insufficient grass cover remains to carry a fire. Loss of grass cover in between shrubs and increased soil surface crusts can further resource redistribution favoring shrub expansion. Erosion can transport soil organic matter and surface soil off site.

Key indicators of approach to transition:

- Loss of grass cover and increased size of bare patches.
- Increases in shrub cover
- Increase in amount of shrub seedlings.
- Erosion and soil degradation indicated by the occurrence of pedestalling, soil deposition, litter movement, and loss of surface soil (exposed sub-surface soil) [5].
- Formation of rills

Transition back to Grassland (1b)
Brush control will be necessary to remove resource competition from shrubs. Pitting and seeding just prior to summer rains will help to break up physical crusts and may aid in seedling germination. Adequate precipitation following seeding is critical and the degree of soil degradation will limit the effectiveness of seedling establishment.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:

This site provides habitat, which supports a resident animal community, characterized by pronghorn antelope, scaled quail, gambel's quail, coyote, badger and black-tailed jackrabbit. This site also provides nesting, hiding and thermal cover for a variety of small rodents, birds and reptiles and their associated predators.

Hydrology Functions:

This site normally receives approximately 12-14 inches annual precipitation. Most summer rainfall occurs as brief sometimes-heavy thunderstorms. Soils are deep, well drained 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: This site is suitable for grazing by all kinds and classes of livestock during all seasons of the year. As this site deteriorates there will be an increase in bare ground leaving the exposed soil susceptible to wind erosion. 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 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
Blue grama	Bouteloua gracilis	EP	D	D	P	P	P	P	P	P	P	P	P	D
Black grama	Bouteloua eripoda	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
Vine mesquite	Panicum obtusum	EP	D	D	P	P	P	P	P	P	P	P	P	D
Halls's panicum	Panicum hallii	EP	D	D	P	P	P	P	P	P	D	D	D	D
Sand dropseed	Sporobolus cryptandrus	EP	D	D	P	P	P	D	D	D	D	D	D	D
Tobosa	Pleuraphis mutica	EP	U	U	D	D	D	D	D	D	U	U	U	U
Alkali sacaton	Sporobolus airoides	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
Threeawn	Aristida	EP	U	U	D	D	D	U	U	U	U	U	U	U
Plains bristlegrass	Setaria vulpiseta	EP	U	U	D	D	D	P	P	P	U	U	U	U
New Mexico feathergrass	Hesperostipa neomexicana	EP	P	P	P	P	P	D	D	D	P	P	P	P
Annual forb		EP	D	D	D	D	D	P	P	P	P	P	P	D
Perennial forb		EP	D	D	P	P	P	P	P	P	D	D	D	D
Croton	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
Desert holly (dwarf desert peony)	Acourtia nana	EP	U	U	U	U	U	U	U	U	U	U	U	U
Silverleaf nightshade	Solanum elaeagnifolium	EP	U	U	U	U	U	U	U	U	U	U	U	U
Prickleaf dogweed	Thymophylla acerosa	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
Fourwing saltbush	Atriplex canescens	S&L	P	P	D	D	D	D	D	D	D	D	D	P
Soaptree yucca	Yucca elata	F&F/S	U	U	D	D	D	D	D	D	U	U	U	U
broom snakeweed	Gutierrezia sarothrae	EP	U	U	U	U	U	U	U	U	U	U	U	U
Cholla	Opuntia spinosior	F, F/S	U	U	U	E	E	E	E	U	U	U	U	U
Pricklypear	Opuntia spp.	F, F/S	U	U	U	E	E	E	E	U	U	U	U	U
Ephedra	Ephedra spp.	S&L	U	U	U	U	U	U	U	U	U	U	U	U

SUPPORTING INFORMATION

Associated sites:

Site Name	Site ID	Site Narrative
Shallow Sandy **Loamy**	**042XD006NM** **042XD001NM**	This site occurs as a component associated with both the shallow sandy and loamy ecological 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	**5**	**1998-2000**	**NM**	**Otero**

State Correlation:

This site has been correlated with the following sites:

Type Locality:

State: **NM**

County: **035**

Latitude:

Longitude:

Township: **21S.**

Range: **11E.**

Section: **10**

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

General Legal Description: **Otero County, New Mexico; about 300 feet north of county road 506 where it intersects the SW 1/4 of the SW 1/4 of Sec. 10, T21S., R11E.**

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:

65-Armesa-Salado complex, 1 to 3 percent slopes (Armesa part)

66-Jerag-Armesa complex 2 to 5 percent slopes (Armesa part)
Other soils included are:

Other References:

1. Drewa, P.B., D.P.C. Peters, and K.M. Havstad. 2001. Fire, grazing and honey mesquite invasion in black grama-dominated grasslands of the Chihuahuan Desert: a synthesis. Pages 31-39 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.

2. Paulsen, H. A. and F. N. Ares. 1962. Grazing values and management of black grama and tobosa grasslands and associated shrub ranges of the southwest. USDA, Forest Service, Tech. Bull. 1270.

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

4. 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.

5. 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.

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