

**UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE**

**ECOLOGICAL SITE DESCRIPTION**

**ECOLOGICAL SITE CHARACTERISTICS**

Site Type: Range

Site ID: R042XC025NM

Site Name: Shallow

Precipitation or Climate Zone: 10 to 13 inches

Phase: \_\_\_\_\_

## PHYSIOGRAPHIC FEATURES

### Narrative:

This site occurs on upland plains, fans and mesas, or between toe slopes of desert hills and drainage ways. Slopes range fro 0 to 15 percent. Direction of slope varies and is usually not significant. Elevations range from 2,842 to 4,500 feet.

### Land Form:

1. plain

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2. fan

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3. mesa

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### Aspect:

1. Not signifant

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- 2.

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- 3.

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Elevation (feet)	Minimum 2,842	Maximum 4,500
Slope (percent)	0	15
Water Table Depth (inches)	N/A	N/A
Flooding:	Minimum	Maximum
Frequency	N/A	N/A
Duration		
Ponding:	Minimum	Maximum
Depth (inches)	N/A	N/A
Frequency		
Duration		

### Runoff Class:

Negligible to High

## CLIMATIC FEATURES

### Narrative:

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity – short duration thunderstorms.

Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.

The average frost-free season is 207 to 220 days. The last killing frost is late March or early April, and the first killing frost is in late October or early November.

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Because of the shallow soil depth, the vegetation on this site can take advantage of moisture almost anytime it falls. Strong winds that blow from the west and southwest blow from January through June, which accelerates soil drying at a critical time for cool season plant growth.

	Minimum	Maximum
Frost-free period (days):	180	221
Freeze-free period (days):	199	240
Mean annual precipitation (inches):	10.0	13.0

### Monthly moisture (inches) and temperature (<sup>0</sup>F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	0.40	0.42	20.6	59.7
February	0.40	0.41	25.2	65.6
March	0.41	0.43	31.4	72.7
April	0.58	0.63	40.4	81.5
May	1.28	1.35	49.6	88.7
June	1.40	1.46	59.1	95.4
July	1.62	1.64	63.3	96.4
August	1.79	1.84	61.6	94.8
September	1.81	2.20	54.1	88.5
October	1.16	1.41	40.7	80.4
November	0.43	0.47	28.4	68.7
December	0.48	0.51	20.9	61.1

Climate Stations:

- (1) NM0600, Artesia, NM - Period of record 1961 - 1990
- (2) NM0992, Bitter Lakes WL Refuge, NM - Period of record 1961 - 1990
- (3) NM1469, Carlsbad, NM - Period of record 1961 - 1990
- (4) NM293792, Hagerman, NM - Period of record 1961 - 1990
- (5) NM299563, Waste Isolation Plant, NM - Period of record 1961 - 1990
- (2) NM4346, Jal, NM - Period of record 1961 - 1990

INFLUENCING WATER FEATURES

<b>Narrative:</b>
This site is not influenced from water from wetlands or streams.

Wetland description:

System	Subsystem	Class
N/A		

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

## REPRESENTATIVE SOIL FEATURES

### Narrative:

The soils of this site are shallow to very shallow. Surface layers are stony silty clay, gravelly loam and gravelly fine sandy loam. There is an indurated caliche layer of limestone bedrock that occurs within 20 inches and averages less than 10 inches. Permeability is moderate and moderately rapid and water holding capacity is low. All water is stored above the caliche layer in the shallow soil profile.

Characteristic soils are:

Delnorte very gravelly loam

Lozier gravelly loam 0 to 5 percent slopes

Potter gravelly loam

Tencee gravelly fine sandy loam

Upton gravelly loam

Vieja stony silty clay

Kimbrough gravelly loam

Parent Material Kind: Alluvium

Parent Material Origin: Mixed

### Surface Texture:

1. gravelly loam

2. gravelly fine sandy loam

3. stony silt clay

### Surface Texture Modifier:

1. gravel

2.

3.

Subsurface Texture Group: N/A

Surface Fragments <=3" (% Cover): 15 - 40

Surface Fragments >3" (% Cover): N/A

Subsurface Fragments <=3" (%Volume): 13 - 42

Subsurface Fragments >=3" (%Volume): 0 - 1

	Minimum	Maximum
Drainage Class:	Well	Well
Permeability Class:	very slow	moderately slow
Depth (inches):	4	24
Electrical Conductivity (mmhos/cm):	0	2
Sodium Absorption Ratio:	N/A	N/A
Soil Reaction (1:1 Water):	7.4	8.4
Soil Reaction (0.1M CaCl <sub>2</sub> ):	N/A	N/A
Available Water Capacity (inches):	1	1
Calcium Carbonate Equivalent (percent):		

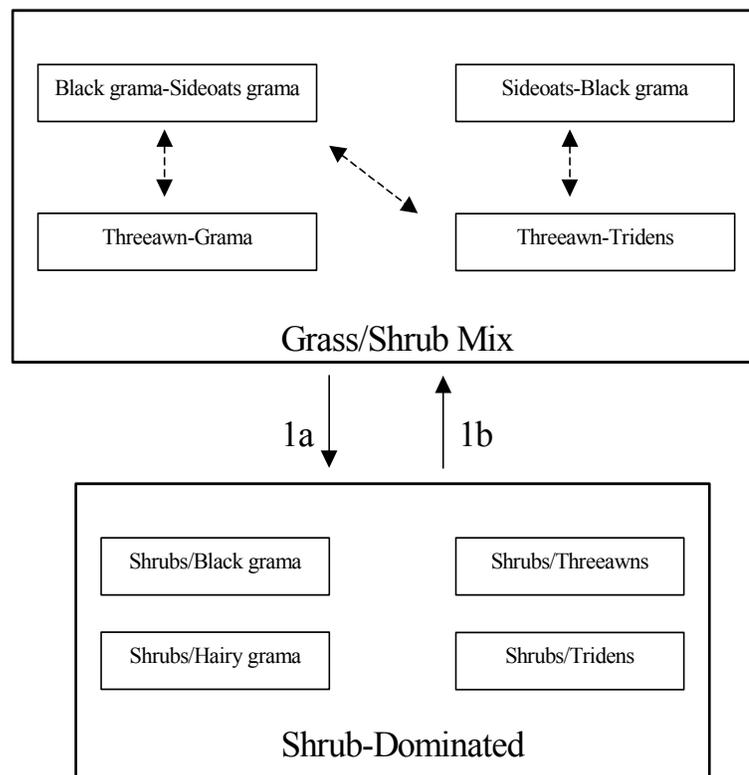
## Ecological Dynamics of the Site:

### Overview

The Shallow site is associated with Limestone Hills, Loamy, and Shallow Sandy sites. When associated with Limestone Hills, the Shallow site occurs on the summits, foot slopes and toeslopes of hills. Loamy sites often occur as areas between low elongated hills with rounded crests (Shallow site). When the Shallow Sandy site and Shallow site occur in association, the Shallow Sandy soils occupy the tops of low ridges and the Shallow site soils occur on the steeper sideslopes of the ridge. The historic plant community of the Shallow site has the aspect of a grassland/shrub mix, dominated by grasses, but with shrubs common throughout the site. Black grama is the dominant grass species; creosotebush, mesquite, and catclaw mimosa are common shrubs. Overgrazing and or extended drought can reduce grass cover, effect a change in grass species dominance, and may result in a shrub-dominated state. Suppression of natural fire regimes may also facilitate the transition to shrub dominance.<sup>1</sup>

### Plant Communities and Transitional Pathways (diagram)

#### MLRA-42, SD-3, Shallow



1a. Extended drought, overgrazing, no fire

1b. Brush control, Prescribed grazing

## Plant Communities Photo Display & Descriptive Diagnosis

### MLRA 42; SD-3; Shallow

#### Grass/Shrub mix



- Threeawns-black grama community
- Grass recovery following treatment with tebuthiuron
- Transition back to Grass/Shrub mix

#### Shrub-Dominated



- Creosotebush-cactlaw mimosa, with some broom snakeweed and a few scattered mesquite
- Grass cover (hairy tridens-black grama) patchy, large connected bare areas present
- Upton gravelly loam, Eddy Co., NM

Plant Community Name: Historic Climax Plant Community

Plant Community Sequence Number: 1 Narrative Label: HCPC

**Plant Community Narrative:**

**State Containing Historic Climax Plant Community**

Grassland/Shrub Mix: The historic plant community is dominated by black grama with sideoats grama as the sub-dominant. Blue grama, hairy grama, bush muhly, and sand dropseed also occur in significant amounts. Sideoats grama can occur as the dominant grass with black grama as sub-dominant on the western side of the Land Resource Unit SD-3. This may be due to higher average elevation on the west side. Retrogression within this state due to extended drought or overgrazing will cause a decrease in species such as black grama, sideoats grama, blue grama, and bush muhly. Threeawns may become the dominant grass species due to a decline in more palatable grasses or because of its ability to quickly recover following drought. Continued loss of grass cover and associated increase in amount of bare ground may result in a shrub-dominated state. Decreased fire frequencies may also be an important component in the cause of this transition.

Diagnosis: Grass cover is fairly uniform, however, surface gravel, cobble, and bare ground make up a large percent of total ground cover, and grass production during unfavorable years may only average 150-175 pounds per acre. Shrubs are common with canopy cover averaging five to ten percent. Evidence of erosion such as rills and gullies are rare, but may occur on slopes greater than eight percent.

Ground Cover (Average Percent of Surface Area).

Grasses & Forbs	10 – 15
Bare ground	40 - 60
Surface cobble and stone	15 - 25
Litter (percent)	5 - 8
Litter (average depth in cm.)	2 - 3

Percent canopy cover (trees, shrubs, and half-shrubs)	
Trees	0
Shrubs and half -shrubs	5 - 10

Plant Community Annual Production (by plant type):

Plant Type	Annual Production (lbs/ac)		
	Low	RV	High
Grass/Grasslike	168	352	536
Forb	20	42	64
Tree/Shrub/Vine	63	131	200
Lichen			
Moss			
Microbiotic Crusts			
Totals	250	525	800

**Plant Community Composition and Group Annual Production:** Plant species are grouped by annual production **not** by functional groups.

Plant Type - Grass/Grasslike

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	BOER4	black grama	105 – 158	105 - 158
2	BOCU	sideoats grama	79 - 105	79 - 105
3	BOGR2	blue grama	79 - 105	79 - 105
3	BOHI2	hairy grama		
4	MUPO2	bush muhly	26 - 53	26 - 53
5	BOBA3	cane bluestem	16 – 26	16 - 26
6	SPCR	sand dropseed	26 – 53	26 - 53
7	ERPI5	hairy tridens	16 – 26	16 – 26
8	MUAR	ear muhly	5 – 16	5 - 16
9	HENE5	New Mexico feathergrass	5 - 16	5 - 16
10	DAPU7	fluffgrass	5 – 16	5 – 16
11	2GP	other grasses	16 – 26	16 – 26

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
18	RHMI3	littleleaf sumac	5 – 16	5 – 16
19	LATR2	cresostebush	5 – 16	5 – 16
20	KRER	range ratany	5 – 16	5 – 16
21	MIERX	common javalinabush	5 – 16	5 – 16
22	FLCE	American tarbush	5 – 16	5 – 16
23	KOSP	spiny allthorn	5 – 16	5 – 16
24	PRGL2	mesquite	11 – 26	11 – 26
25	MIACB	catclaw mimosa	5 – 16	5 - 16
26	OPUNT	cactus	5 - 16	5 - 16
27	PAIN2	mariola	11 – 26	11 - 26
28	GUSA2	broom snakeweed	5 – 16	5 – 16
29	2SHRUB	other shrubs	16 – 26	16 - 26

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
12	TEACE	stemless actinea	11 – 26	11 – 26
13	PACAL5	wooly groundsel	5 - 16	5 - 16
14	SPHAE	globemallow	5 - 16	5 - 16
15	LESQU	bladderpod	5 - 16	5 - 16
16	CASSI	Senna	5 - 16	5 - 16
17	2FORB	other forbs	11 – 26	11 - 26

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

Other grasses that could appear on this site would include: vine-mesquite, silver bluestem, burrograss, spike dropseed, threeawns, tobosa, muhlys, Arizona cottontop and plains bristlegrass

Other woody plants include: condalia, tesajo cactus, Apacheplume, wolfberry, cactus, ephedra spp., yucca, witerfat and fourwing saltbush.

Other forbs include: desert zinnia, wooly paperflower, prickleaf dogweed, verbena, deerstongue, croton and wright’s buckwheat.

Plant Growth Curves

Growth Curve ID: NM2825  
 Growth Curve Name: HCPC  
 Growth Curve Description: SD-3 Shallow HCPC Warm Season Plant Community

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	3	5	10	10	25	30	12	5	0	0

**Additional States:**

**Shrub-Dominated:** This state is characterized by an increase in shrubs and a decrease in grass cover relative to grassland/shrub mix. As grass cover decreases shrubs increase, especially creosotebush, catclaw mimosa, whitethorn acacia, and mesquite. Each of these shrub species may become dominant in localized areas or across the site, depending on the spatial variability in soil characteristics and landscape position. Black grama, threeawns, hairy grama, or hairy tridens may be the dominant grass species. Fluffgrass, burrograss and broom snakeweed increase in representation. The Shallow site is resistant to further state change, due to the natural rock armor of the soil and a shallow impermeable layer. The amount of rock fragments on the soil surface assist in retarding erosion. On Shallow sites with low slope, the shallow depth to either a petrocalcic layer or limestone bedrock helps to keep water perched and available to shallow rooted grasses for extended periods. <sup>2</sup>

**Diagnosis:** Shrubs are the dominant species, especially creosotebush, catclaw mimosa, whitethorn acacia, or mesquite. Grass cover is variable ranging from patchy with large connected bare areas present to sparse with only a limited amount in shrub inter-spaces.

**Transition to Shrub-Dominated (1a)** Overgrazing and or extended periods of drought, and suppression of natural fire regimes are thought to cause this transition. As grass cover is lost, soil fertility and available soil moisture decline, due to the reduction of organic matter and decreased infiltration.<sup>3</sup> Shrubs have the ability to extract nutrients and water from a greater area of soil than grasses and are better able to utilize limited water. Competition by shrubs for water and nutrients limits grass recruitment and establishment. Fire historically may have played a part in suppressing shrub expansion; fire suppression may therefore facilitate shrub expansion.

Key indicators of approach to transition:

- Decrease or change in composition or distribution of grass cover.
- Increase in size and frequency of bare patches.
- Increase in amount of shrub seedlings.

**Transition back to Grassland/Shrub Mix (1b)** Brush control is necessary to re-establish grasses. Prescribed grazing will help to ensure proper forage utilization and sustain grass cover. Once the transition is reversed and grass cover is re-established, prescribed fire might help in maintaining the Grassland/Shrub state.

## ECOLOGICAL SITE INTERPRETATIONS

### Animal Community:

This site provides habitats which support a resident animal community that is characterized by desert cottontail, spotted ground squirrel, Merriam's kangaroo rat, cactus mouse, white-throated woodrat, gray fox, spotted skunk, roadrunner, Swainson's hawk, white-necked raven, cactus wren, pyrrhuloxia, lark sparrow, mourning dove, scaled quail, leopard lizard, round-tailed horned lizard, prairie rattlesnake, Couch's spadefoot toad, marbled whiptail, and greater earless lizard.

Where associated with limestone hills, mule deer utilize this site. Where large woody shrubs occur, most resident birds and scissor-tailed flycatcher, morning dove, lark sparrow and Swainson's hawk nest.

### Hydrology Functions:

The runoff curve numbers are determined by field investigations using hydraulic cover conditions and hydrologic soil groups.

#### Hydrologic Interpretations

Soil Series	Hydrologic Group
Delnorte	C
Lozier	D
Potter	C
Tencee	D
Upton	C
Kimbrough	D
Vieja	D

### Recreational Uses:

This site offers recreation potential for hiking, horseback riding, rock hunting, nature photography and bird hunting and birding. During years of abundant spring moisture, a colorful array of wild flowers is displayed during May and June. A few summer and fall flowers also occur.

### Wood Products:

This site has no potential for wood production.

**Other Products:**

This site is suited for grazing by all kinds and classes of livestock during all seasons of the year. Missmanagement will cause a decrease in black grama, sideoats grama, and blue grama, bush muhly and New Mexico feathergrass. A corresponding increase in bare ground will occur. There will also be an increase in muhlys, fluffgrass, creosotebush, javalinabush and mesquite. This site will respond best to a system of management that rotates the season of use.

**Other Information:**

## Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index	Ac/AUM
100 - 76	3.7 – 4.5
75 – 51	4.3 – 5.5
50 – 26	5.3 – 10.0
25 – 0	10.1 +

**Plant Preference by Animal Kind:**

	Code	Species Preference	Code
Stems	S	None Selected	N/S
Leaves	L	Preferred	P
Flowers	F	Desirable	D
Fruit/Seeds	F/S	Undesirable	U
Entire Plant	EP	Not Consumed	NC
Underground Parts	UP	Emergency	E
		Toxic	T

Animal Kind: Livestock

Animal Type: Cattle

Common Name	Scientific Name	Plant Part	Forage Preferences												
			J	F	M	A	M	J	J	A	S	O	N	D	
black grama	<i>Bouteloua eriopoda</i>	EP	P	P	P	D	D	D	D	D	D	D	D	P	P
sideoats grama	<i>Bouteloua curtipendula</i>	EP	P	P	P	P	P	P	P	P	P	P	P	P	P
blue grama	<i>Bouteloua gracilis</i>	EP	D	D	D	D	P	P	P	P	P	P	D	D	D
hairy grama	<i>Bouteloua hirsuta</i>	EP	D	D	D	D	P	P	P	P	P	P	D	D	D
bush muhly	<i>Muhlenbergia porterti</i>	EP	P	P	P	P	P	P	P	P	P	P	P	P	P
cane bluestem	<i>Bothriochloa barbinodis</i>	EP	U	U	U	U	U	U	P	P	D	U	U	U	
sand dropseed	<i>Sporobolus cryptandrus</i>	EP	U	U	U	D	D	D	D	D	D	U	U	U	
globemallow	<i>Sphaeralcea</i>	EP	N/S	N/S	N/S	D	D	D	D	D	P	P	P	N/S	
bladderpod	<i>Lesquerella</i>	EP	N/S	N/S	D	D	D	D	N/S	N/S	N/S	N/S	N/S	N/S	
Senna	<i>Cassia L.</i>	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
cresostebush	<i>Larrea tridentata</i>	L	U	U	U	U	U	U	U	U	U	U	U	U	
common javalinabush	<i>Microrhamnus eridoides</i>	EP	U	U	U	U	U	U	U	U	U	U	U	U	
American tarbush	<i>Flourensia cernua</i>	EP	U	U	U	U	U	U	U	U	U	U	U	U	
mesquite	<i>Prosopis glandulosa</i>	EP	U	U	U	U	U	U	U	U	U	U	U	U	
catclaw mimosa	<i>Mimosa aculeaticarpa</i>		U	U	U	U	U	U	U	U	U	U	U	U	
cactus	<i>opuntia sp.</i>	EP	E	E	E	E	E	E	E	E	E	E	E	E	
mariola	<i>Parthenium incanum</i>	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
broom snakeweed	<i>Gutierrezia sarothrae</i>	L/F	U	U	U	U	U	T	T	U	U	U	U	U	

## Supporting Information

### Associated Sites:

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
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### Similiar Sites:

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
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### State Correlation:

This site has been correlated with the following states: Texas

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
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### Type Locality:

### Relationship to Other Established Classifications:

### Other References:

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 (SD-3). This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Characteristic soils are:

Delnorte very gravelly loam	Lozier gravelly loam 0-5% slope	Potter gravelly loam
Tencee gravelly fine sandy loam	Upton gravelly loam	Vieja stony silty clay
Kingrough gravelly loam		

1. Humphrey, R.R. 1974. Fire in the deserts and desert grassland of North America. In: Kozlowski, T. T.; Ahlgren, C. E., eds. Fire and ecosystems. New York: Academic Press: 365-400.
2. Hennessy, J.T., R.P. Gibbens, J.M. Tromble, and M. Cardenas. 1983. Water properties of caliche. J. Range Manage. 36: 723-726.
3. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheets. Rangeland Soil Quality—Infiltration, Organic Matter, Rangeland Sheets 5,6. [Online]. Available: <http://www.statlab.iastate.edu/survey/SQI/range.html>

### Site Description Approval:

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Don Sylvester	07/12/1979	Don Sylvester	07/12/1979

### Site Description Revision:

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
David Trujillo	03/26/03	George Chavez	03/26/03

