

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

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R070XD152NM

Site Name: Shallow

Precipitation or Climate Zone: 13 to 18 inches

Phase: _____

PHYSIOGRAPHIC FEATURES

Narrative:

This site consists of shallow soils occupying upland plains, gently sloping side slopes and tops of mountain foothills. Slopes vary from 1 to 9 percent, but average 5 percent. Direction of the slope varies and is not significant. Elevations range from 4,000 to 7,000 feet above sea level.

Land Form:

1. Plain
2. Hillsides
- 3.

Aspect:

1. N/A
- 2.
- 3.

Elevation (feet)	Minimum 4,000	Maximum 7,000
Slope (percent)	1	9
Water Table Depth (inches)	N/A	N/A
Flooding:	Minimum	Maximum
Frequency	N/A	N/A
Duration	N/A	N/A
Ponding:	Minimum	Maximum
Depth (inches)	N/A	N/A
Frequency	N/A	N/A
Duration	N/A	N/A

Runoff Class:

Negligible to medium.

CLIMATIC FEATURES

Narrative:

The climate of this area is ‘semi-arid continental.’

The average annual precipitation ranges from 13 to 18 inches. Variations of 5 inches, more or less, are not uncommon. Approximately 70 percent of this occur from May through October. Most of the summer precipitation comes in the form of high-intensity, short-duration thunderstorms. Winter moisture is usually negligible.

Distinct seasonal changes and large annual and diurnal temperature changes characterize temperatures. The average annual temperature ranges from 55 degrees F to 60 degrees F with extremes of 20 degrees F below zero in the winter to 110 degrees F in the summer.

The average frost-free season is 190 to 200 days. The last killing frost is in early April with the first killing frost being in mid October.

Both temperature and precipitation favor warm-season, perennial plant communities. Sufficient late winter and early spring moisture allows cool-season species to occupy a minor component within the plant community in favorable years. Due to the shallow soil profile vegetation responds well to light rains. Strong winds blow from February through June from the west and southwest. This tends to dry out the soil during a critical period for cool-season plant growth.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> web site using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F respectively.

	Minimum	Maximum
Frost-free period (days):	<u>160</u>	<u>191</u>
Freeze-free period (days):	<u>180</u>	<u>221</u>
Mean annual precipitation (inches):	<u>13</u>	<u>18</u>

Monthly moisture (inches) and temperature (°F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	.47	.56	21.4	56.6
February	.50	.54	23.8	62.1
March	.49	.57	28.5	68.5
April	.54	.60	35.0	76.7
May	1.13	1.44	43.2	83.5
June	1.78	1.84	51.6	92.2
July	1.87	2.98	55.7	92.1
August	2.29	3.26	54.2	90.3
September	2.67	2.80	48.2	84.3
October	1.24	1.40	37.6	76.7
November	.53	.55	27.5	65.5
December	.60	.68	21.6	57.8

Climate Stations:

Station ID	Location	From:	To:
292865	Elk 2E	6/1/1895	12/31/00
294112	Hope	03/01/19	12/31/00

INFLUENCING WATER FEATURES

Narrative:

This site is not influenced by water from a 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 on this site are shallow to very shallow, well drained over indurated caliche. Depth averages 9 to 18 inches. The soils have a moderate to moderately rapid permeability and a low water-holding capacity. Surface textures vary from loam to cobbly loam.

Parent Material Kind: Alluvium

Parent Material Origin: Mixed

Surface Texture:

1. Loam

2. Cobbly loam

3. Gravelly loam

Surface Texture Modifier:

1. Gravel

2. Cobble

3.

Subsurface Texture Group: Loamy

Surface Fragments $\leq 3''$ (% Cover): 15 to 35

Surface Fragments $> 3''$ (% Cover): 15 to 35

Subsurface Fragments $\leq 3''$ (% Volume): 15 to 35

Subsurface Fragments $\geq 3''$ (% Volume): 15 to 25

	Minimum	Maximum
Drainage Class:	Well	Well
Permeability Class:	Moderate	Moderately rapid
Depth (inches):	< 9	> 18
Electrical Conductivity (mmhos/cm):	Unknown	Unknown
Sodium Absorption Ratio:	Unknown	Unknown
Soil Reaction (1:1 Water):	Unknown	Unknown
Soil Reaction (0.1M CaCl₂):	Unknown	Unknown
Available Water Capacity (inches):	3	6
Calcium Carbonate Equivalent (percent):	Unknown	Unknown

PLANT COMMUNITIES

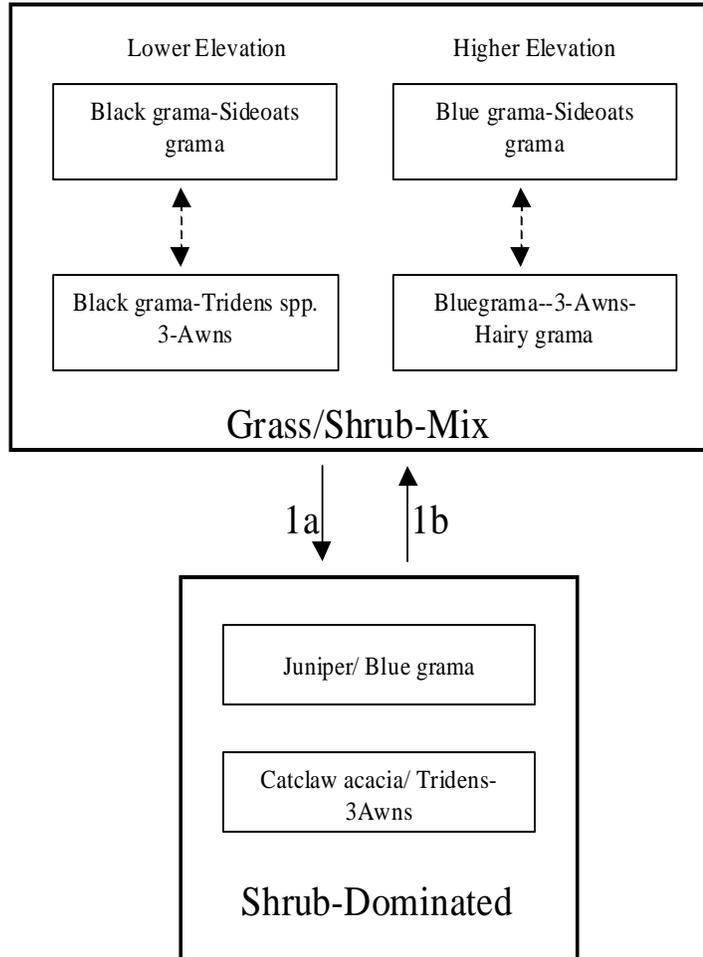
Ecological Dynamics of the Site:

Overview

This site is associated with Limestone Hills and Loamy sites. It typically occurs as elongated ridges, terraces, and fans in valleys at the base of Limestone Hills. The Loamy sites occur alongside Shallow sites, but in a lower position. The Shallow site is differentiated from associated sites by shallow depth (<20 inches) to a petrocalcic horizon, and slopes less than ten percent. The historic plant community of the Shallow site is a grassland/shrub-mix, dominated by grasses, with shrubs common and evenly distributed. Black grama is the dominant grass species at lower to mid-elevations, with blue grama dominating at higher elevations. This site is susceptible to encroachment by shrubs, especially catclaw acacia and juniper. Dispersal of shrub seeds, competition for resources, loss of grass cover, and a decrease in natural fire regimes may facilitate the transition to a shrub-dominated state.

Plant Communities and Transitional Pathways (diagram)

MLRA 70, CP-4 Shallow



1a. Seed dispersal, resource competition by shrubs, overgrazing, lack of fire.

1b. Brush control, prescribed grazing, prescribed fire.

Stat and Transition Model photos will be posted as they become available.

Plant Community Name: Historic Climax Plant Community

Plant Community Sequence Number: 1 **Narrative Label:** HCPC

Plant Community Narrative: State Containing Historic Climax Plant Community

Grass/Shrub-Mix:

In the historic plant community, black grama is the dominant grass species with sideoats grama occurring as the sub-dominant. Other species that occur in significant numbers include tridens species, blue grama, hairy grama, and threeawns. At higher elevations blue grama typically dominates with sideoats grama as the sub-dominant. Little bluestem and cane bluestem are favored at higher elevations. There is also an increase in cool season grasses such as bottlebrush squirreltail and needlegrass species at higher elevations. There is a wide variety of shrubs/succulents that can occur on this site. Species such as catclaw acacia, yucca, creosotebush, javalina bush, cholla, and sotol are more typical of the lower to mid-elevations, while juniper, oak species, mountain mahogany, and skunkbush sumac are more common as elevation increases. Continuous heavy grazing will cause a decrease in black grama, sideoats grama, bluestems, and other highly palatable grasses. There will be a corresponding increase in threeawns, tridens, wolftail, dropseeds, and hairy grama.

Diagnosis: Grass cover is uniformly distributed, however, rock fragments and bare ground make up a large percent of the total ground cover, and grass production during unfavorable years may only average 250-375 pounds per acre. Shrubs/succulents are common with canopy cover averaging 2 to 5 percent. Evidence of erosion such as rills and gullies are infrequent

Canopy Cover:	
Trees and shrubs	2 to 5 %
Ground Cover (Average Percent of Surface Area).	
Grasses & Forbs	40
Bare ground	37
Surface cobble and stone	15
Litter (percent)	8
Litter (average depth in cm.)	2

Plant Community Annual Production (by plant type): _____

Plant Type	Annual Production (lbs/ac)		
	Low	RV	High
Grass/Grasslike	306	527	748
Forb	36	62	88
Tree/Shrub/Vine	81	140	198
Lichen			
Moss			
Microbiotic Crusts			
Total	450	775	1,100

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	BOER4	Black Grama	155 – 310	155 – 310
2	BOCU	Sideoats Grama	78 – 116	78 – 116
3	SCBR2 MURI	Burrograss (lower elevations only) Mat Muhly (higher elevations only)	23 – 39	23 – 39
4	TRIDE	Tridens spp.	39 – 78	39 – 78
5	BOHI2 BOGR2	Hairy Grama Blue Grama	39 – 78	39 – 78
6	ARIST	Threeawn spp.	39 – 62	39 – 62
7	SPORO	Dropseed spp.	8 – 39	8 – 39
8	SCSC BOBA3	Little Bluestem (higher elevations only) Cane Bluestem (higher elevations only)	39 – 62	39 – 62
9	MUSE	Curlyleaf Muhly	16 – 39	16 – 39
10	SEVU2	Plains Bristlegrass	16 – 39	16 – 39
11	PAHA	Hall's Panicum	16 – 39	16 – 39
12	ERIN	Plains Lovegrass	16 – 62	16 – 62
13	2GRAM	Other Grasses	16 – 39	16 - 39

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
14	ERIOG	Wildbuckwheat spp.	8 – 16	8 – 16
15	THAC	Prickleleaf Dogweed	8 – 23	8 – 23
16	SENNA	Senna spp.	8 – 23	8 – 23
17	CROTO	Croton spp.	8 – 23	8 – 23
18	2FORB	Other Forbs	39 – 54	39 - 54

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
19	ACGR	Catclaw Acacia	16 – 39	16 – 39
20	YUCCA	Yucca spp.	8 – 23	8 – 23
21	GUSA2	Broom Snakeweed	8 – 23	8 – 23
22	2SD	Other Shrubs	38 – 78	39 - 78

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 which may appear on this site include: fluffgrass, tobosa, green sprangletop, bottlebrush squirreltail, Indiangrass, little awn needlegrass, creeping muhly, silver bluestem and wolftail.

Other shrubs include: catclaw mimosa, Apacheplume, Bigelow sagebrush, yerba-de-pasmo, algerita, hairy mountainmahogany, dalea spp., creosotebush, oak spp., skunkbush sumac, cholla, sotol, ephedra spp., winterfat, pale wolfberry, threadleaf groundsel, javelina bush, sacahuista and juniper.

Other forbs include: cutleaf haplopappus, woolly Indianwheat, bladderpod, yarrow, desert holly, desert baileya, fleabane, verbena, deer tongue, and blanket flower.

Plant Growth Curves

Growth Curve ID 4602NM

Growth Curve Name: HCPC

Growth Curve Description: Mixed short/mid warm-season grassland with significant shrub component. Forbs vary from year to year.

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 the predominance of shrubs, with perennial grasses as the subordinate component. Different species of shrubs may dominate depending on elevation and available soil moisture. Catclaw acacia may dominate at lower elevations, usually in localized areas with tridens and/or threeawns as the primary grasses. Juniper dominates at higher elevations with blue grama as the subordinate component. In the juniper-dominated community and the catclaw acacia-dominated community, other succulents and shrubs such as yucca, cholla, pricklypear, sumac species, oak species and algerita typically increase in representation.

Diagnosis: Juniper or catclaw acacia is the dominant species. Grass cover is patchy with large connected bare areas present. Tridens, threeawns, or blue grama is the primary grass species, and, dropseeds, fluffgrass, mat muhly, and creeping muhly, increase in representation.

Transition to Shrub-Dominated (1a) Seed dispersal of shrubs, resource competition between shrubs and grasses, loss of grass cover, and lack of fire are all believed to facilitate the increase and encroachment of shrubs. Wildlife and livestock (especially birds and sheep) are instrumental in the dispersal of juniper seed.^{3, 5} Deer, rabbits, rodents, birds, and other wildlife are associated with the dispersal of catclaw acacia seed.⁴ Competition for resources in conjunction with drought, and overgrazing may favor shrub encroachment. During years of limited rainfall, good grass cover may suppress shrub seedling survival by competing directly for soil moisture. Competition is more important during shrub seedling establishment when their roots are in the same zone as the grasses.² During this time shrub seedlings and grasses may be competing directly for soil moisture. Overgrazing may facilitate the establishment of shrub seedlings by providing competition free areas, but livestock exclusion alone would not prevent shrub expansion. During wet years competition for available soil moisture is reduced and shrub seedlings may establish in good stands of grass,² and the natural spatial variability of ground cover may allow shrubs to establish on bare areas within good grass stands when adequate moisture is available.¹ Short duration drought may favor grasses. Unlike shrub seedlings, perennial grasses have the ability to go dormant during drought. Long term drought can reduce grass cover and favor established shrubs. Following long term drought shrubs are favored by increased area of bare ground (competition free) on which to establish. If fire was historically important in the development of Shallow Site plant communities, by suppressing seed production and survival during years of adequate grass cover, then restoration of natural fire regimes may be valuable in maintaining grass dominance.

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 Grass/Shrub -Mix (1b) Brush control is necessary to initiate the transition back to grass dominance. Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover. Once the transition back to the Grassland State is achieved prescribed fire may help in maintaining grass dominance.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:

Habitat for Wildlife:

This site provides habitat which supports a resident animal community that is characterized by pronghorn antelope, bobcat, coyotes, black-tailed jackrabbit, spotted ground squirrel, plains pocket mouse, southern plains woodrat, horned lark, and scaled quail. Mule deer feed in this site during certain seasons of the year.

Hydrology Functions:

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

Hydrologic Interpretations

Soil Series	Hydrologic Group
Penasco	D
Espy	?
Ector	C
Tencee	?

Recreational Uses:

This site offers limited potential for hiking, picnicking, horseback riding, and backpacking. The main limitations are lack of water and shade. Hunting is good for antelope, dove, quail, and varmints. Trapping for fur-bearing animals is also good. The terrain typical of the wide-open spaces enhances the natural beauty, and by the large variety of flowering forbs that are produced during years of adequate moisture.

Wood Products:

This site has no value for wood products.

Other Products:

Grazing:

This site is suited for grazing by all kinds and classes of livestock during all seasons of the year. Flexibility in livestock numbers is important. This site responds well to a planned system of grazing that rotates the season of use. Under continuous mismanagement, species like black grama, sideoats grama, and the bluestems decrease in composition while threeawn spp., dropseed spp., burrograss, and tridens spp., increase in composition. In a deteriorated condition, the percentage of bare ground increases, thereby increasing the erosion hazard. Both wind and water erosion can become serious if this site is continually mismanaged. Predator control should be considered during calving season and when grazing sheep or goats.

Other Information:

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index	Ac/AUM
100 - 76	3.0 – 4.5
75 – 51	4.0 – 6.5
50 – 26	6.0 – 11.0
25 – 0	11.0+

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

Plant Preference by Animal Kind:

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
Blue Grama	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
Black Grama	Bouteloua eriopoda	EP	P	P	P	D	D	D	D	D	D	D	P	P
Sideoats Grama	Bouteloua curtipendula	EP	P	P	P	P	P	P	P	P	P	P	P	P
Little Bluestem	Schizachyrium scoparium	EP	D	D	D	P	P	P	P	D	D	D	D	D
Cane Bluestem	Bothriochloa barbinodis	EP	U	U	U	U	U	U	P	P	D	U	U	U
Plains Bristlegrass	Setaria vulpiseta	EP	D	D	D	D	P	P	P	P	P	D	D	D
Hall's Panicum	Panicum hallii	EP	D	D	D	D	P	P	P	P	D	D	D	D

Animal Kind: Livestock

Animal Type: Sheep

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Black Grama	Bouteloua eriopoda	EP	P	P	P	D	D	D	D	D	D	D	P	P
Sideoats Grama	Bouteloua curtipendula	EP	P	P	P	P	P	P	P	P	P	P	P	P
Blue Grama	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
Forbs	Various	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

Animal Kind: Livestock

Animal Type: Goats

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Croton	Croton spp.	L/S	D	D	D	D	P	P	P	D	D	D	D	D
Senna	Senna spp.	L/S	D	D	D	D	D	D	D	D	D	D	D	D
Wildbuckwheat	Eriogonum spp.	EP	U	U	D	D	D	D	D	D	U	U	U	U
Shrubs	Various	L/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S

Animal Kind: Wildlife

Animal Type: Mule deer

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Croton	Croton spp.	L/S	D	D	D	D	P	P	P	D	D	D	D	D
Senna	Senna spp.	L/S	D	D	D	D	D	D	D	D	D	D	D	D
Wildbuckwheat	Eriogonum spp.	EP	U	U	D	D	D	D	D	D	U	U	U	U
Shrubs	Various	L/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S

Animal Kind: Wildlife

Animal Type: Antelope

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Croton	Croton spp.	L/S	D	D	D	D	D	D	D	D	D	D	D	D
Wildbuckwheat	Eriogonum spp.	EP	U	U	D	D	D	D	D	D	U	U	U	U
Hall's Panicum	Panicum hallii	EP	D	D	D	D	D	D	D	D	D	D	D	D

SUPPORTING INFORMATION

Associated sites:

Site Name	Site ID	Site Narrative

Similar sites:

Site Name	Site ID	Site Narrative

State Correlation:

This site has been correlated with the following sites: _____

Inventory Data References:

Data Source	# of Records	Sample Period	State	County

Type Locality:

State: New Mexico

County: Chavez, Eddy, Lincoln, Otero

Latitude: _____

Longitude: _____

Township: _____

Range: _____

Section: _____

Is the type locality sensitive? Yes No

General Legal Description: _____

Relationship to Other Established Classifications:

Other References:

Data collection for this site was done in conjunction with the progressive soil surveys within the Pecos-Canadian Plains and Valleys 70 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Otero, Eddy, Chaves, Lincoln

References

1. Brown, J. R. and S. Archer. 1999. Shrub invasion of grassland: recruitment is continuous And not regulated by herbaceous biomass or density. Ecology 80:2385-2396.
2. Johnsen, T. N., Jr. 1962. One-seeded juniper invasion of northern Arizona grasslands. Ecological Monographs. 32:187-207.
3. Parker, K. W. 1945. Juniper comes to the grassland. American Cattle Producer. 27: 12-14.
4. Pendleton, R. L., B. K. Pendleton, and K T. Harper. 1989. Breeding systems of woody plant species in Utah. In: Wallace, Arthur; McArthur, E. Durant; Haferkamp, Marshall R., compilers. Proceedings--symposium on shrub ecophysiology and biotechnology; 1987 June 30 - July 2; Logan, UT. Gen. Tech. Rep. INT-256. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 5-22.

5. Phillips, Frank J. 1910. The dissemination of junipers by birds. Forestry Quarterly. 8: 60-73. (From Expt. Sta. Rec. 22: 644.)

Characteristic Soils Are:	
Penasco	
Other Soils included are:	
Espy	Ector
Tencee	

Site Description Approval:

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Don Sylvester	02/02/82	Donald H. Fulton	03/03/82

Site Description Revision:

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Elizabeth Wright	07/10/02	George Chavez	12/17/02
David Trujillo	10/29/03		10/29/03