

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

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R070XD151NM

Site Name: Limestone Hills

Precipitation or Climate Zone: 13 to 18 inches

Phase: _____

PHYSIOGRAPHIC FEATURES

Narrative:

This site occurs as hills, low mountains, and foot slopes of higher mountains. Slopes range from 15 to 75 percent and average 20 percent. Elevation ranges from 4,000 to 7,000 feet above sea level. This site is a complex of soils, fractured limestone aspect and degree of slope. Aspect varies and is very important. North slopes are cooler, have better soil moisture relationship, and therefore, produce more forage and a varied community.

Land Form:

1. Hills

2. Low mountains

3. Foot slopes

Aspect:

1. North slopes

- 2.

- 3.

	Minimum	Maximum
Elevation (feet)	4,000	7,000
Slope (percent)	15	75
Water Table Depth (inches)	N/A	N/A
	Minimum	Maximum
Flooding:		
Frequency	N/A	N/A
Duration	N/A	N/A
	Minimum	Maximum
Ponding:		
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.’”

Annual average precipitation ranges from 13 to 18 inches. Variations of 5 inches, more or less, are not uncommon. Approximately 70 percent of this occurs 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 not uncommon.

The average frost-free season is 180 to 200 days, the last killing frost being in early April and the first killing frost in mid October.

Both temperature (especially south slopes) and precipitation favor warm-season species. However, approximately 40 percent of the precipitation (and temperatures on the north slopes) is favorable to cool-season growth at the middle to higher elevations. This could allow the cool-season plants to occupy a very important part of this complex plant community. Due to the shallow soil profile, vegetation responds well to light rains. Moisture can also be stored relatively deep in the seams and cracks of fractured limestone. This moisture is also available for plant use. Slope aspect is also important when the strong winds from the west and southwest blow. These winds, which blow from February to June, cause the soil to dry during the critical growth stage for many cool-season species. The north slopes are somewhat protected and do not dry as fast as the south slopes.

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):	160	191
Freeze-free period (days):	180	221
Mean annual precipitation (inches):	13	18

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 of this site are complex with rocky outcrops with interspaces from very shallow to deep. The deeper soils occur along the seams and cracks in the fractured limestone. The soils are well drained. Permeability is moderate to moderately slow. Water-holding capacity is low except at seams and cracks in the limestone bedrock. Surface textures are cobbly loams, stony or rocky loams and cobbly silt loams. The soils of this site are over fractured limestone bedrock.

Parent Material Kind: Marine deposits

Parent Material Origin: Limestone - unspecified

Surface Texture:

- | |
|------------------|
| 1. Cobbly loam |
| 2. Gravelly loam |
| 3. Stony loam |
| 4. Rock loam |

Surface Texture Modifier:

- | |
|-----------|
| 1. Cobble |
| 2. Gravel |
| 3. Stone |
| 4. Rock |

Subsurface Texture Group: Cobbly loam

Surface Fragments <=3" (% Cover): 15 to 35

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

Subsurface Fragments <=3" (%Volume): 15 to 35

Subsurface Fragments >=3" (%Volume): 15 to 35

	Minimum	Maximum
Drainage Class:	<u>Well</u>	<u>Well</u>
Permeability Class:	<u>Moderately slow</u>	<u>Moderate</u>
Depth (inches):	<u>4</u>	<u>>72</u>
Electrical Conductivity (mmhos/cm):	<u>N/A</u>	<u>N/A</u>
Sodium Absorption Ratio:	<u>N/A</u>	<u>N/A</u>
Soil Reaction (1:1 Water):	<u>7.9</u>	<u>8.4</u>
Soil Reaction (0.1M CaCl2):	<u>N/A</u>	<u>N/A</u>
Available Water Capacity (inches):	<u>3</u>	<u>6</u>
Calcium Carbonate Equivalent (percent):	<u>N/A</u>	<u>N/A</u>

PLANT COMMUNITIES

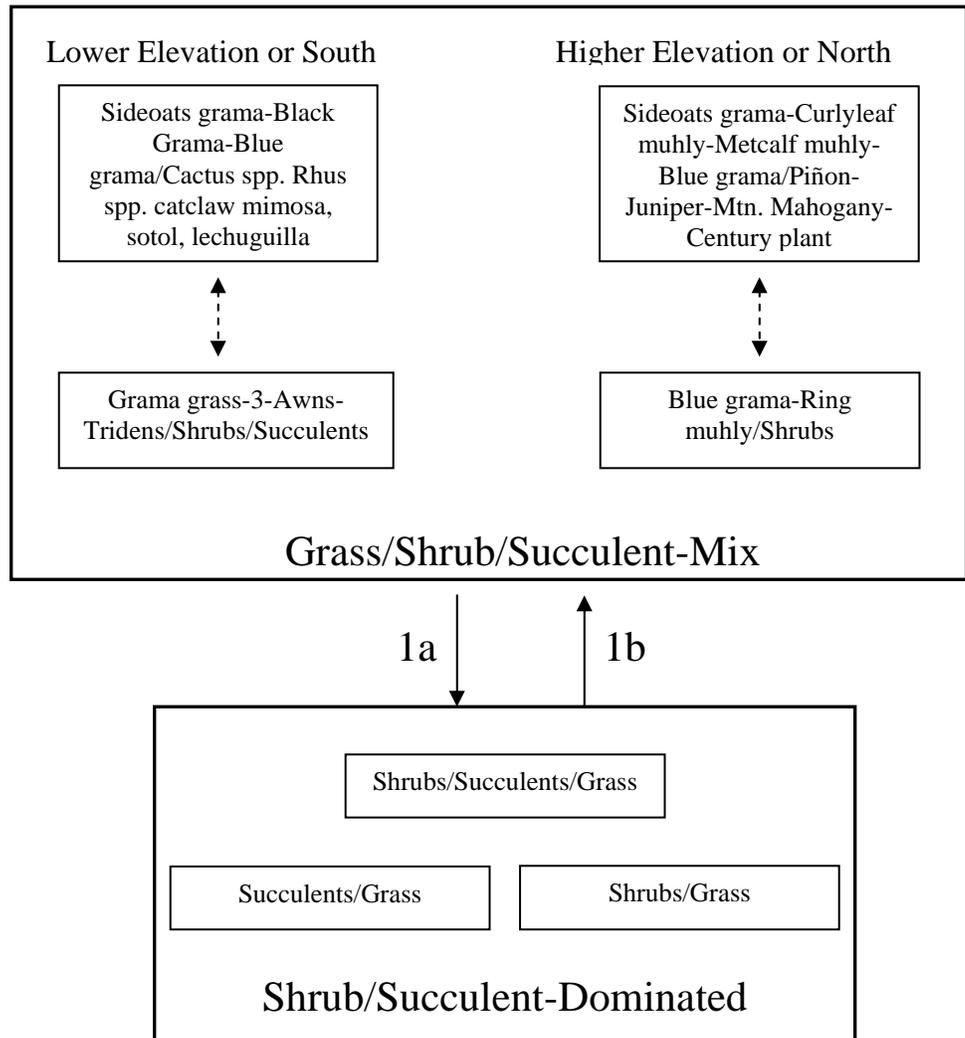
Ecological Dynamics of the Site:

Overview:

The Limestone Hills site is associated with Swale, Very shallow, and Shallow sites. Swale sites often dissect the lower footslopes of Limestone Hills. Very Shallow and Shallow sites can occur as upland plains adjacent to, but topographically lower than Limestone Hills. The historic plant community of Limestone Hills has the aspect of a Grass/Shrub/Succulent mix. Grasses are the dominant component followed by shrubs and succulents. Forbs are the minor component, but can increase significantly during years of abundant rainfall. Slope-aspect and elevation play an important role in determining plant community composition and production. North aspects and higher elevations typically have more cool season grasses, juniper, piñon, and oak. South aspects have more forbs, succulents, and desert shrubs. Dispersal of shrub/succulent seed, resource competition, loss of grass cover, and reduced fire frequency are reported to be factors that may facilitate the transition to a Shrub/Succulent-Dominated state.

Plant Communities and Transitional Pathways (diagram)

MLRA 70, CP-4 Limestone Hills



1a. Seed dispersal, resource competition, loss of grass cover, lack of fire?

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

MLRA 70; CP-4; Limestone Hills

Grass/Shrub/Succulent-Mix



- Sideoats grama, blue grama, black grama, Pinchot juniper, littleleaf sumac
- Grass cover uniformly distributed
- Ector extremely rocky loam, 9-25% slopes, Eddy Co. NM

Grass/Shrub/Succulent-Mix



- Sideoats grama, curlyleaf muhly, Pinchot juniper, wavy leaf oak, yucca
- Grass cover fairly uniform
- Ector extremely rocky loam, 9-25% slopes, Eddy Co. NM

Shrub/Succulent-Dominated



- Juniper, blue grama, some cholla, yucca
- Many small juniper seedlings
- Grass cover moderate, fairly uniform
- Deama-Rock Outcrop Complex- 35-65% slopes, Otero Co. NM

Plant Community Name: Historic Climax Plant Community

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

Plant Community Narrative: Historic Climax Plant Community

State Containing Historic Plant Community

Grass/Shrub/Succulent-Mix: Sideoats grama is typically the dominant grass species of the historic plant community. Blue grama, black grama, curlyleaf muhly, and Metcalf muhly are sub-dominants. North aspects and higher elevations exhibit higher densities of cool season grasses, such as bottlebrush squirreltail, western wheatgrass, and needlegrass species. This site produces a wide variety of shrubs/succulent species. Juniper, piñon, and oaks are more common on north aspects and higher elevations, while catclaw mimosa is typically found on south-facing slopes or lower elevations. Succulents common to this site include yucca, sacahuista, cholla, pricklypear, sotol, lechuguilla, and agave. Most succulents seem to be better adapted to the warmer south and west-facing slopes and lower elevations. Sacahuista, however, is more tolerant of cooler temperatures and higher elevations.¹ Continuous heavy grazing by livestock will cause an increase in threeawns, tridens, and ring muhly. At lower elevations threeawns and tridens may become sub-dominant to grama grasses. At higher elevations blue grama may come to dominate with ring muhly as the sub-dominant. Dispersal of shrub and succulent seed, resource competition, loss of grass cover, and fire suppression may initiate the transition to a state dominated by shrubs/succulents.

Diagnosis: Grass cover is fairly uniform, but rock fragments and limestone outcrops make up a large percent of the total ground cover. Sideoats grama is typically the dominant grass species. Shrubs/succulents are common with canopy cover averaging 15-20%.

Canopy Cover:

Trees	10 %
Shrubs and half shrubs	10 %
Ground Cover (Average Percent of Surface Area).	
Grasses & Forbs	<u>30 – 35</u>
Bare ground	<u>10 – 18</u>
Surface cobble and stone	<u>15 – 20</u>
Litter (percent)	<u>10 – 15</u>
Litter (average depth in cm.)	<u>3</u>

Plant Community Annual Production (by plant type): _____

Plant Type	Annual Production (lbs/ac)		
	Low	RV	High
Grass/Grasslike	406	711	1,015
Forb	70	123	175
Tree/Shrub/Vine	245	429	613
Lichen			
Moss			
Microbiotic Crusts			
Total	700	1,225	1,750

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	BOCU	Sideoats Grama	184 – 306	184 – 306
2	BOGR2	Blue Grama	61 – 184	61 – 184
3	BOER4	Black Grama	123 – 306	123 – 306
4	ERIN	Plains Lovegrass	61 – 123	61 – 123
5	MUSE MURI3	Curlyleaf Muhly Metcalf Muhly	184 – 306	184 – 306
6	ARIST	Threeawn spp.	12 – 61	12 – 61
7	SPORO TRIDE	Dropseed spp. Tridens spp.	12 – 61	12 – 61
8	LEDU	Green Sprangletop	61 – 123	61 – 123
9	2GRAM	Other Grasses	12 – 61	12 – 61

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
10	PAIN2	Mariola	61 – 86	61 – 86
11	BAILE	Marigold spp.	12 – 37	12 – 37
12	ACMI2	Yarrow	12 – 37	12 – 37
13	MAPIG2	Cutleaf Haplopappus	12 – 37	12 – 37
14	2FORB	Other Forbs	12 – 61	12 – 61

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
15	YUCCA	Yucca spp.	12 – 61	12 – 61
16	NOMI	Sacahuista (Nolina)	12 – 61	12 – 61
17	RHUS	Sumac spp.	25 – 61	25 – 61
18	GUSA2	Broom Snakeweed	12 – 61	12 – 61
19	ARBI3	Bigelow Sagebrush	12 – 61	12 – 61
20	BAPT	Yerba-de-pasmo	12 – 61	12 – 61
21	2SD	Other Shrubs (North slopes)	61 – 123	61 – 123
22	CEMOP MIACB	Hairy Mountainmahogany Catclaw Mimosa (South slopes)	61 – 123	61 - 123

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: hairy grama, ring muhly, Hall’s panicum, wolftail, western wheatgrass, bottlebrush squirreltail, silver bluestem, little bluestem, and plains bristlegrass. Needlegrasses may occur on favored north slopes.

Other shrubs that may appear include: cactus spp., algerita, dalea spp., sotol, juniper, pinyon, oak spp., winterfat, Apacheplume, wolfberry, century plant, lechuquilla, fourwing saltbush, ceanothus, allthorn, and brickelbush.

Other forbs that may appear include: pricklyleaf dogweed, groundsel spp., globemallow spp., wildbuckwheat spp., verbena spp., desert holly, wooly Indianwheat, fiddleneck, Indian paintbrush, phlox spp., and penstemon spp.

Plant Growth Curves

Growth Curve ID 4601NM

Growth Curve Name: HCPC

Growth Curve Description: A mixed mid/tall, warm/cool-season grassland with a major shrub, half-shrub and forb component.

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/Succulent-Dominated: This state is characterized by the predominance of shrubs and/or succulents, with perennial grasses as the subordinate component. Juniper may dominate at mid-to higher elevations. Pinchot juniper has a limited distribution in New Mexico and is typically the dominant in the CP-4 resource unit at mid-elevations in the Guadalupe Mountains. Oneseed and alligator juniper have a wider distribution and may dominate a mid-to higher elevations on Limestone Hills throughout most of CP-4. At lower elevations, catclaw mimosa may dominate in localized areas, often forming dense thickets along headers and drainageways. Blue grama is often the primary grass species associated with increased densities of juniper, while threeawns, tridens, hairy grama, and black grama are more strongly associated with catclaw mimosa. Sotol, agave species, sacahuista, or cholla may become the dominant succulent. Sotol and agave are often co-dominant in localized areas, usually on south and west aspects along side slopes of hills. It may be that local dominance by sotol and or agave is natural and due to their adaptability on the shallower rocky limestone soils. Sacahuista is better adapted to the cooler north and east aspects and may dominate with sideoats and curlyleaf muhly as subordinate species. On the slightly deeper soils of ridge tops and benches historically overgrazed by sheep, cholla may be the dominant species with mat muhly occurring as a sub-dominant.

Diagnosis: Shrubs, and/or succulents are found at increased densities relative to the grass/shrub/succulent mix. Grass cover is variable ranging from relatively uniform to patchy with frequent areas of bare soil present.

Transition to Shrub/Succulent-Dominated (1a) Transitions to a Shrub/Succulent-Dominated state may occur as a result of seed dispersal, resource competition between shrubs and grasses, loss of grass cover, and a decrease in natural fire frequencies. Wildlife, livestock, water, and wind may all act as dispersal agents for many of the shrubs and succulents. Competition for resources (especially soil moisture) may lead to the decline of grasses, and an increase in shrubs by providing a competition-free area for seedling establishment.² Competition between grasses and succulents seems to be less important. Research has indicated that removal of cholla and prickly pear does not result in significant increases in grass production,^{3,4,5} indicating low direct competition between some succulents and herbaceous understory plants. Overgrazing and/or drought can reduce grass cover, provide shrubs with a competitive advantage, and reduce fine fuels necessary to carry fire. Historically fire may have played a role in limiting the density of succulents and shrubs by reducing the number of young plants, and in cases of more severe fire, killing mature plants.⁶ Fire may also cause mortality by weakening the plants and making them more susceptible to damage by insects and rodents.

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/succulent seedlings.

Transition back to Grass/Shrub/Succulent-Mix (1b) Chemical control is an effective means of controlling many shrubs and succulents. Prescribed fire may be a suitable option depending on target species and the amount of fine fuels available to carry fire. Species such as oneseed juniper and cholla have been controlled successfully with fire. Pinchot juniper, alligator juniper, catclaw mimosa and sacahuista are not as susceptible due to their ability to resprout following fire. Prescribed grazing will help ensure proper forage utilization, sustain grass cover, and retard the establishment of shrubs.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:

This site provides habitats which supports a resident animal community characterized by mule deer, desert cottontail, rock squirrel, Botta's pocket gopher, cactus mouse, white-throated woodrat, ringtail, bobcat, golden eagle, Swainson's hawk, rock wren, brown towhee, scaled quail, collared lizard, tree lizard, spadefoot toad, red-spotted toad, rock rattlesnake, mountain patchnosed snake.

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
Deama	C
Ector	C
Holloman Variant	C

Recreational Uses:

This site offers recreation potential for hiking, horseback riding, nature observation, photography, rock hunting, and hunting for mule deer, antelope, quail, dove and varmints. Trapping for fur-bearing animals is good. The variety of shrubs and forbs adds to the natural beauty of the area during times of adequate moisture.

Wood Products:

Juniper and pinyon offer some supply of fuelwood and fencing material. However, due to the shallow soil depth, great care must be taken in harvesting this material.

Other Products:**Grazing:**

This site is suited for grazing by all kinds and classes of livestock, during all seasons of the year, and is best utilized by a combination of grazing animals. South slopes usually receive more intensive use during the spring, due to early green-up. The north slopes receive more intensive use during the summer months. This site provides an abundance of high quality browse species to compliment the grass species. The vegetation of this site responds well to planned deferment periods. A planned system of grazing, which rotates the season of use, will allow all the vegetation of this site to increase in vigor and production. This will also help to control invasion of undesirable species. Under retrogression, this site will show an increase in woody plants, at higher elevations annuals and grasses like ring muhly, threeawn spp., and dropseed spp. The use of goats can help control the invasion of woody plants. Predator control should be considered when grazing this site with sheep or goat or during calving season.

Other Information:**Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month**

Similarity Index	Ac/AUM
100 - 76	2.0 – 4.0
75 – 51	3.5 – 5.0
50 – 26	4.8 – 8.0
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
Sideoats Grama	Bouteloua curtipendula	EP	P	P	P	P	P	P	P	P	P	P	P	P
Black Grama	Bouteloua eriopoda	EP	P	P	P	D	D	D	D	D	D	D	P	P
Western Wheatgrass	Pascopyrum smithii	EP	D	D	P	P	P	D	D	D	D	D	D	D
Green Sprangletop	Leptochloa dubia	EP	U	U	D	D	D	U	U	U	U	U	U	U
Little Bluestem	Schizachyrium scoparium	EP	D	D	D	P	P	P	P	D	D	D	D	D
Hairy Mountainmahogany	Cercocarpus montanus	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: Livestock

Animal Type: Sheep

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
Sumac spp.	Rhus spp.	L/S	P	P	P	D	D	D	D	D	D	P	P	P
Green Sprangletop	Leptochloa dubia	EP	U	U	D	D	D	U	U	U	U	U	U	U
Tridens spp.	Tridens spp.	EP	U	U	U	U	U	D	D	D	U	U	U	U
Hairy Mountainmahogany	Cercocarpus montanus	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
Sideoats Grama	Bouteloua curtipendula	EP	P	P	P	P	P	P	P	P	P	P	P	P

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
Mariola	Parthenium incanum	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
Sumac spp.	Rhus spp.	L/S	P	P	P	D	D	D	D	D	D	P	P	P
Hairy Mountainmahogany	Cercocarpus montanus	L/S	D	D	D	D	D	D	D	D	D	D	D	D

Animal Kind: Wildlife

Animal Type: Deer

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Hairy Mountainmahogany	<i>Cercocarpus montanus</i>	L/S	P	P	P	P	P	P	P	P	P	P	P	P
Sideoats Grama	<i>Bouteloua curtipendula</i>	EP	P	P	P	P	P	P	P	P	P	P	P	P
Plains Bristlegrass	<i>Setaria vulpiseta</i>	EP	D	D	D	D	D	D	D	D	D	D	D	D
Sumac spp.	<i>Rhus</i> spp.	L/S	P	P	P	P	P	P	P	P	P	P	P	P
Yerba-de-pasmo	<i>Baccharis pteroniodes</i>	L	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Mariola	<i>Parthenium incanum</i>	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

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:

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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. Gehlbach, F.R. 1967. Vegetation of the Guadalupe Escarpment, New Mexico-Texas. Ecology. 48(3): 404-419.
2. Johnsen, T. N., Jr. 1962. One-seeded juniper invasion of northern Arizona grasslands. Ecological Monographs. 32:187-207.
3. Kunst, C. R., R. E. Sosebee, and M. J. Dumesnil. 1988. Herbicidal control of cholla. Society of range Management. Abstract Papers. 41: 67.
4. Martin, S. C., J. L. Thames, and E. B. Fish. 1974. Changes in cactus numbers and herbage production. Prog. Agric. Ariz. 26: 3-6.
5. Pieper, R. D. 1971. Blue grama vegetation responds inconsistently to cholla cactus control. Journal of Range Management. 24: 52-54
6. Wright, H.A., and A.W. Bailey. 1982. Fire ecology: United States and southern Canada. New York: John Wiley and Sons. 501p.

Characteristic Soils Are:	
Deama	Ector
Holloman Variant	Limestone Rockland
Other Soils included are:	

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	10/31/03
David Trujillo	10/29/03		