

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

**ECOLOGICAL SITE DESCRIPTION**

**ECOLOGICAL SITE CHARACTERISTICS**

**Site Type:** Rangeland

**Site ID:** R036XC103NM

**Site Name:** Hills

**Precipitation or Climate Zone:** 12 to 16 inches

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

## PHYSIOGRAPHIC FEATURES

### **Narrative:**

This site is characterized by rolling to steep hills and mountain footslopes. Slopes range from a low of 15 percent to an extreme high of 75 percent, and exposure or direction of slope is variable. Elevation range from about 5,000 to 7,000 feet above sea level.

### **Land Form:**

1. Hill

2.

3.

### **Aspect:**

1. N/A

2.

3.

	<b>Minimum</b>	<b>Maximum</b>
<b>Elevation (feet)</b>	5,000	7,000
<b>Slope (percent)</b>	15	75
<b>Water Table Depth (inches)</b>	N/A	N/A
	<b>Minimum</b>	<b>Maximum</b>
<b>Flooding:</b>		
<b>Frequency</b>	N/A	N/A
<b>Duration</b>	N/A	N/A
	<b>Minimum</b>	<b>Maximum</b>
<b>Ponding:</b>		
<b>Depth (inches)</b>	N/A	N/A
<b>Frequency</b>	N/A	N/A
<b>Duration</b>	N/A	N/A

### **Runoff Class:**

Negligible to medium.

## CLIMATIC FEATURES

### **Narrative:**

Average annual precipitation varies from about 12 inches to just over 16 inches. Substantial fluctuations from year to year are common, ranging from a low of about 6 inches to a high of over 30 inches. Approximately one-half of the annual precipitation comes in the form of rainfall during the months of July, August, and September, although wintertime precipitation in the form of snow, sleet, or rain is sometimes significant. Spring and late fall months are normally dry.

The average frost-free period ranges from about 165 to 190 days and extends from approximately the third or fourth week in April to mid October. Average annual air temperatures are about 56 degrees F. Summer maximums can exceed 100 degrees F and winter minimums on occasion go below zero. Monthly mean temperatures generally exceed 70 degrees F for the period of June through August.

Growing conditions favor warm-season perennial vegetation, although late winter and late summer precipitation is adequate to foster a significant cool-season component in the potential plant community. Occasional wet springs also create good conditions for annual forb production, but frequent winds from the west and southwest are common during this time of year and tend to deplete soil moisture at a critical time for the growth of these plants.

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.

	<b>Minimum</b>	<b>Maximum</b>
<b>Frost-free period (days):</b>	<u>125</u>	<u>187</u>
<b>Freeze-free period (days):</b>	<u>146</u>	<u>211</u>
<b>Mean annual precipitation (inches):</b>	<u>12</u>	<u>16</u>

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

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	.37	1.22	16.2	55.6
February	.35	.94	18.6	60.1
March	.26	.95	22.1	66.1
April	.26	.42	27.0	74.2
May	.12	.58	34.0	82.6
June	.53	.98	42.8	92.0
July	2.29	3.32	52.5	92.6
August	2.50	3.22	51.4	89.9
September	1.62	2.85	43.5	85.7
October	1.17	1.81	32.0	76.2
November	.41	1.58	22.0	64.4
December	.61	.185	15.9	55.9

**Climate Stations:**

Station ID	Location	Period
299806	Chloride Ranger Stn., NM	From: 05/14/49 To: 12/31/00
291910	Cliff 11SE, NM	From: 01/01/37 To: 12/31/00
294009	Hillsboro, NM	From: 10/01/24 To: 12/31/00
297386	Hood Ranger Stn., NM	From: 04/01/54 To: 12/31/00
298324	Silver City, NM	From: 01/01/61 To: 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:**

Soils characterizing this site are typically shallow, stony and/or cobbly with loams, clay loams, and sandy loams over bedrock. Included are occasional areas or pockets of deeper soils that are stony. They have water intake rates that are moderate and permeability that is moderately slow to moderately rapid. They occur on slopes of 15 percent or more.

**Parent Material Kind:** Slope alluvium

**Parent Material Origin:** Mixed

### **Surface Texture:**

1. Stony loam
2. Very gravelly loam
3. Cobbly loam
4. Gravelly sandy loam
5. Loam
6. Very cobbly clay loam
7. Cobbly stony loam
8. Gravelly loam

### **Surface Texture Modifier:**

1. Stone
2. Gravel
3. Cobble

**Subsurface Texture Group:** Loamy

**Surface Fragments  $\leq 3''$  (% Cover):** 15 to 60

**Surface Fragments  $> 3''$  (% Cover):** 15 to 60

**Subsurface Fragments  $\leq 3''$  (%Volume):** 3 to 57

**Subsurface Fragments  $> 3''$  (%Volume):** 0 to 35

	<b>Minimum</b>	<b>Maximum</b>
<b>Drainage Class:</b>	Well	Excessively
<b>Permeability Class:</b>	Very slow	Moderately rapid
<b>Depth (inches):</b>	4	$> 72$
<b>Electrical Conductivity (mmhos/cm):</b>	0.00	2.00
<b>Sodium Absorption Ratio:</b>	N/A	N/A
<b>Soil Reaction (1:1 Water):</b>	5.6	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>):</b>	N/A	N/A
<b>Available Water Capacity (inches):</b>	1	3
<b>Calcium Carbonate Equivalent (percent):</b>	N/A	N/A

## PLANT COMMUNITIES

### Ecological Dynamics of the Site:

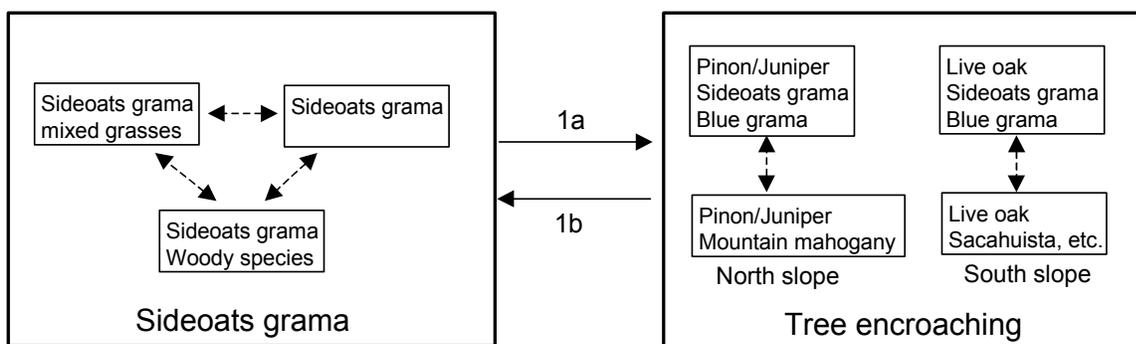
#### Overview

The hills site often intergrades with breaks sites and may border loamy sites. The historic plant community type is dominated by sideoats grama (*Bouteloua curtipendula*). Other grasses, including blue grama (*Bouteloua gracilis*) and black grama (*Bouteloua eriopoda*) may be subordinates depending upon aspect and hillslope position. Shrubs and trees, including one-seed juniper (*Juniperus monosperma*) and shrub oak (*Quercus* spp.) are more common on north-facing slopes. It unclear why trees such as juniper and piñon pine (*Pinus edulis*) become dominant at the expense of grasses in some cases. Regional increases in the relative amount of winter rainfall, decreases in fire frequency, or grazing may facilitate woody plant establishment, and subsequent erosion or competition may inhibit the recolonization of grasses.

No systematic studies of communities, states or transitions have been performed in the hills site.

#### Plant Communities and Transitional Pathways (diagram)

State-Transition model: MLRA 36, WP-3, Low soil-depth group: Hills



**Plant Community Name:** Historic Climax Plant Community

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

**Plant Community Narrative:**

State Containing the Historic Climax Plant Community

**Sideoats grama:** The expression of the historic community type depends upon aspect, slope position, and location within the subresource area. On south-facing slopes, black grama is more common as a co-dominant with sideoats grama. Black grama is also more common on the east side of WP-3 near the border with SD-2. On north-facing slopes or steep slopes where seeds are trapped and water infiltration and retention is increased by rock cover, sideoats grama is highly dominant and little bluestem (*Schizachyrium scoparium*), blue grama and hairy grama (*Bouteloua hirsuta*) are subordinates. Tobosa (*Pleuraphis mutica*) tends to occur at hill bases where run-on water is received. Woody plants and succulents, including sacahuista (*Nolina* spp.), one-seed juniper, alligator juniper (*Juniperus deppeana*), and mountain mahogany (*Cercocarpus montanus*) are present and may be more common on north-facing slopes and hilltops. Variation in plant community composition may occur in response to drought (e.g. reduction in woody plants) or grazing.

Diagnosis: Sideoats grama is dominant in most patches and perennial grass cover between trees and shrubs is more or less continuous. Evidence of erosion is infrequent.

**Canopy Cover:**

Trees	8 %
Shrubs and half shrubs	7 %

**Ground Cover (Average Percent of Surface Area).**

Grasses & Forbs	24
Bare ground	8
Surface gravel	25
Surface cobble and stone	25
Litter (percent)	18
Litter (average depth in cm.)	2

**Plant Community Annual Production (by plant type):** \_\_\_\_\_

Plant Type	Annual Production (lbs/ac)		
	Low	RV	High
Grass/Grasslike	403	657	910
Forb	46	75	104
Tree/Shrub/Vine	115	188	260
Lichen			
Moss			
Microbiotic Crusts			
<b>Total</b>	<b>575</b>	<b>938</b>	<b>1,300</b>

**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	141 – 188	141 – 188
2	BOGR2	Blue Grama	94 – 141	94 – 141
3	BOHI2	Hairy Grama	9 – 28	9 – 28
4	BOER4	Black Grama	47 – 94	47 – 94
5	SCSC BOBA3 ERIN LEDU	Little Bluestem Cane Bluestem Plains Lovegrass Green Sprangletop	47 – 94	47 – 94
6	MUMO MUEM MUWR	Mountain Muhly Bullgrass Spike Muhly	47 – 94	47 – 94
7	LYPH KOMA	Wolftail Prairie Junegrass	9 – 28	9 – 28
8	ARIST	Threeawn spp.	9 – 28	9 – 28
9	ELEL5 HENE5	Bottlebrush Squirreltail New Mexico Feathergrass	47 – 94	47 – 94
10	2GRAM	Other Grasses	28 – 47	28 - 47

**Plant Type - Forb**

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
11	ERIOG PLPA2 SEFLF	Wild Buckwheat Wooly Indianwheat Threadleaf Groundsel	28 – 47	28 – 47
12	2FA	Other Annual Forbs	9 – 29	9 – 29
13	2FP	Other Perennial Forbs	9 – 47	9 - 47

**Plant Type – Tree/Shrub/Vine**

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
14	QUERC NOMI	Oak spp. Sacahuista	28 – 75	28 – 75
15	RHTR CEMOP GAWR	Skunkbush Sumac Hairy Mountainmahogany Wright Silktassel	47 – 75	47 – 75
16	FAPA DAFO ERNAN5 GUSA2	Apacheplume Feather Dalea Rubber Rabbitbrush Broom Snakeweed	9 – 47	9 – 47
17	JUNIP	Juniper spp.	47 – 75	47 – 75
18	2SD	Other Shrubs	9 – 28	9 - 28

**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**    0603NM

**Growth Curve Name:**    HCPC

**Growth Curve Description:**    Mixture of plant communities dictated by exposure with north facing slopes have more trees and shrubs and south facing slopes are more grassland.

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	5	7	10	15	25	25	8	5	0	0

**Additional States:**

**Transition to tree-encoaching state (1a):** It is unclear why woody plants become dominant, although it is likely that the subsequent decline in grasses is due to competition for water and nutrients and from erosional soil loss between woody plants. The formation of bare ground patches due to grazing, decreases in fire frequency, and increases in winter precipitation may be responsible either independently or in concert. The presence of grassland stands that are unburned and in which piñon and juniper have not invaded suggests that fire is not the sole limitation of tree encroachment.

**Key indicators of approach to transition:** Increases in bare ground, decreases in litter cover and grass cover, increased frequency of tree seedlings (threshold may have been crossed), decreased fire frequency.

*Tree-encroaching*: In this state, grass cover is reduced, shrubs and trees are dominant, and bare ground cover is high. Erosion rates may be relatively high. Grazing or summer drought may reduce grass cover within this state, but it can recover to subdominant status. On north-facing slopes, piñon and juniper tend to become dominants in this state, whereas south-facing slopes may be dominated by live oak and sacahuista. Mountain mahogany is an important subordinate on hilltops and north-facing slopes in this state. Blue grama is often the dominant grass.

Diagnosis: Oak, juniper, or piñon are common and bare patches are associated with trees and shrub clumps but also exist in interspaces where erosion has occurred. Bare ground may be interconnected such that runoff is not intercepted by grasses.

**Transition to sideoats state (1b)**: Tree and shrub removal may release grasses from competition. Deferment of grazing may be used to allow grasses to recover and subsequent increases in fire frequency may be used to inhibit tree germination.

*Information sources and theoretical background*: Communities, states, and transitions are based upon information in the ecological site description and observations by Gene Adkins, NRCS.

## **ECOLOGICAL SITE INTERPRETATIONS**

### **Animal Community:**

#### Habitat for Wildlife:

This site provides habitat which can support a resident animal community characterized by mule deer, desert cottontail, rock squirrel, rock pocket mouse, brush mouse, white-throated woodrat, gray fox, bobcat, scrub jay, red-shafted flicker, cliff swallow, Bewick's wren, blue-grey gnatcatcher, rufous-crowned sparrow, scaled quail, mourning dove, red-spotted toad, collared lizard, tree lizard, short-horned lizard, alligator lizard, rock rattlesnake, black-tailed rattlesnake, and mountain patchnosed snake.

Where rock ledges and cliffs are present, prairie falcon, great horned owl, and golden eagle hunt over the site. Where the site is adjacent to ponderosa pine or mixed conifer areas, elk may range into this site to feed.

### **Hydrology Functions:**

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

#### **Hydrologic Interpretations**

<b>Soil Series</b>	<b>Hydrologic Group</b>
Abrazo	D
Cascajo	A
Chiricahua	D
Encierro	D
Gaddes	C
Lithic Ustorthents	D
Luzena	D
Muzzler	D
Oro Grande	D
Puertecito	D
Santa Fe	D
Santana	D

**Recreational Uses:**

This site offers recreation potential for hiking, rock climbing, horseback riding, nature observation, photography, bird watching, and hunting for mule deer, quail and mourning dove.

During certain seasons, when favorable soil moisture conditions exist, the site displays a colorful array of wildflowers.

**Wood Products:**

This site has a limited potential for firewood and fence-post production where sufficient juniper is present and where steepness of slope does not make harvesting prohibitive.

**Other Products:**

Grazing:

This site is suitable for grazing in all seasons of the year, although most of the forage is produced during the summer months. It is adapted for cattle, sheep, goats, and horses, generally without regard to class of animal or season of use. Continuous yearlong grazing may, however, result in a decline or disappearance of cool-season grasses and preferred browse plants, especially if grazing use is prolonged and heavy. Because of the presence of significant amounts of both woody and herbaceous plants, the site is particularly suited to grazing by more than one species of animal (such as goats and cattle, sheep and cattle, and/or wildlife) to maintain a healthy balance of woody and herbaceous plants. Serious deterioration in the plant community may be characterized by heavy stands of juniper and oak brush, and the site is rarely suited to mechanical brush control or seeding.

**Other Information:**

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

<b>Similarity Index</b>	<b>Ac/AUM</b>
100 - 76	3.4 – 4.6
75 – 51	4.3 – 6.8
50 – 26	6.5 – 11.5
25 – 0	11.5+

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
Sideoats Grama	<i>Bouteloua curtipendula</i>	EP	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	D	D	D
Black Grama	<i>Bouteloua eriopoda</i>	EP	P	P	P	D	D	D	D	D	D	D	D	P
Little Bluestem	<i>Schizachyrium scoparium</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
Green Sprangletop	<i>Leptochloa dubia</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
Mountain Muhly	<i>Muhlenbergia montana</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
New Mexico Feathergrass	<i>Hesperostipa neomexicana</i>	EP	D	D	P	P	P	D	D	D	D	D	D	D
Spike Muhly	<i>Muhlenbergia wrightii</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
Hairy Mountainmahogany	<i>Cercocarpus montanus</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
Wright Siltkassel	<i>Garrya wrightii</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
Wild Buckwheat	<i>Eriogonum spp.</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

**Animal Kind:** Livestock

**Animal Type:** Horses

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Sideoats Grama	<i>Bouteloua curtipendula</i>	EP	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	D	D	D
Black Grama	<i>Bouteloua eriopoda</i>	EP	P	P	P	D	D	D	D	D	D	D	P	P
Little Bluestem	<i>Schizachyrium scoparium</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
Green Sprangletop	<i>Leptochloa dubia</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
Mountain Muhly	<i>Muhlenbergia montana</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
New Mexico Feathergrass	<i>Hesperostipa neomexicana</i>	EP	D	D	P	P	P	D	D	D	D	D	D	D
Spike Muhly	<i>Muhlenbergia wrightii</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
Bullgrass	<i>Muhlenbergia emersleyi</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
Bottlebrush Squirreltail	<i>Elymus elymoides</i>	EP	U	U	D	D	D	U	U	U	D	D	D	U

**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
Hairy Mountainmahogany	<i>Cercocarpus montanus</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
Wright Silktassel	<i>Garrya wrightii</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
Oak Species	<i>Quercus</i> spp.	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
Skunkbush Sumac	<i>Rhus trilobata</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
New Mexico Feathergrass	<i>Hesperostipa neomexicana</i>	EP	U	U	D	D	D	U	U	U	D	D	D	U
Wild Buckwheat	<i>Eriogonum</i> spp.	EP	U	U	D	D	D	D	D	D	U	U	U	U
Most other 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

**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: Grant, Catron, Hidalgo, Sierra, Socorro

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 New Mexico and Arizona Plateaus and Mesas 36 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Socorro, Sierra, Grant, Catron.

**Characteristic Soils Are:**

Luzena

**Other Soils included are:**

Abrazo, Cascajo, Chiricahua, Daze, Encierro	Gaddes, Lithic Ustorthents, Luzena, Muzzler
Oro Grande, Puertecito, Santa Fe, Santana	Sedillo

**Site Description Approval:**

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Don Sylvester	04/25/80	Durwood E. Ball	04/29/80

**Site Description Revision:**

Elizabeth Wright	07/05/02	George Chavez	04/02/03
Dr. Brandon Bestelmeyer	04/02/03		