UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R036XB118NM

Site Name: Bottomland

Precipitation or Climate Zone: 10-16"

Phase:

PHYSIOGRAPHIC FEATURES

Narrative:

This site occurs in valley or flood plain positions, including large swales or draws with substantial drainage areas, which receive periodic inundation from floodwaters. Slopes average less than 3 percent. Elevations range from 6000 to 7300 feet.

Land Form:

1. flood plain
2. valley floor
3. valley

Aspect:

1. not significant
2.
3.

	Minimum	Maximum
Elevation (feet)	6000	7596
Slope (percent)	0	4
Water Table Depth (inches)	--	--

Flooding:	Occasional	Frequent
Frequency	--	Very brief
Duration	--	--

Ponding:	Minimum	Maximum
Depth (inches)	--	--
Frequency	-	--
Duration	--	--

Runoff Class:

Negligible to medium

CLIMATIC FEATURES

Narrative:

Average annual precipitation varies from about 10 inches to just over 16 inches. Fluctuations ranging from about 5 inches to 25 inches are not uncommon. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. As much as half or more of the annual precipitation can be expected to come during the period of July through September. Thus, fall conditions are often more favorable for good growth of cool-season perennial grasses, shrubs, and forbs than are those of spring.

The average frost-free season is about 120 days and extends from approximately mid-May to early or mid-September. Average annual air temperatures are 50 degrees F or lower and summer maximums rarely exceed 100 degrees F. Winter minimums typically approach or go below zero. Monthly mean temperatures exceed 70 degrees F for the period of July and August.

Rainfall patterns generally favor warm-season perennial vegetation, while the temperature regime tends to favor cool-season vegetation. This creates a somewhat complex community of plants on a given range site which is quite susceptible to disturbance and is at or near its productive potential only when both natural warm- and cool- season dominants are present.

	Minimum	Maximum
Frost-free period (days):	51	171
Freeze-free period (days):	130	252
Mean annual precipitation (inches):	10	16

Monthly moisture (inches) and temperature (^{0}F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	.40	.91	12.9	47.0
February	.43	.65	16.6	51.2
March	.47	1.10	20.9	57.1
April	.30	.49	26.1	65.3
May	.46	.98	33.4	74.2
June	.51	.57	41.4	84.2
July	2.15	3.45	50.4	85.1
August	2.28	3.03	48.7	82.4
September	1.29	1.68	41.4	77.9
October	.81	1.12	29.4	69.2
November	.38	.71	19.1	57.3
December	.53	.95	13.1	48.9

Climate Stations:

					Period		
Station ID	290640	Location	Augustine2E	From:	05/01/26	To:	07/31/00
Station ID	296812	Location	Pietown 19NE	From:	09/01/88	To:	07/31/00
Station ID	297180	Location	Quemado	From:	08/01/15	To:	07/31/00

Period

INFLUENCING WATER FEATURES

Narrative:

This site is not influenced by water from wetlands or streams.

Wetland description:

System	Subsystem	Class
N/A		

If Riverine Wetland System enter Rosgen Stream Type:

N/A

REPRESENTATIVE SOIL FEATURES

Narrative:

These soils are deep with moderately fine to moderately coarse-textured surfaces. Permeability is moderate to moderately slow, and the available water capacity is moderately high to high. A thin strata of subsurface materials from gravel to clay is common. Erosion hazard is slight when vegetative cover is at or near its potential.

Parent Material Kind: Alluvium

Parent Material Origin: Mixed material derived from sandstone, siltstone and shale

Surface Texture:

1. Clay loam
2. Sandy clay loam
3. Silt loam

Surface Texture Modifier:

1. N/A
2.
3.

Subsurface Texture Group: Clay loam, sandy clay loam, silt loam

Surface Fragments <=3" (% Volume): --

Surface Fragments >3" (% Volume): --

Subsurface Fragments <=3" (%Volume): 7-13%

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

	Minimum	Maximum
Drainage Class:	weak	Somewhat excessively
Permeability Class:	Very slow	Moderately rapid
Depth (inches):	0	60
Electrical Conductivity (mmhos/cm):	0	2.0
Sodium Absorption Ratio:	--	--
Soil Reaction (1:1 Water):	7.4	9.0
Soil Reaction (0.1M CaCl2):	--	--
Available Water Capacity (inches):	4	8
Calcium Carbonate Equivalent (percent):	--	--

PLANT COMMUNITIES

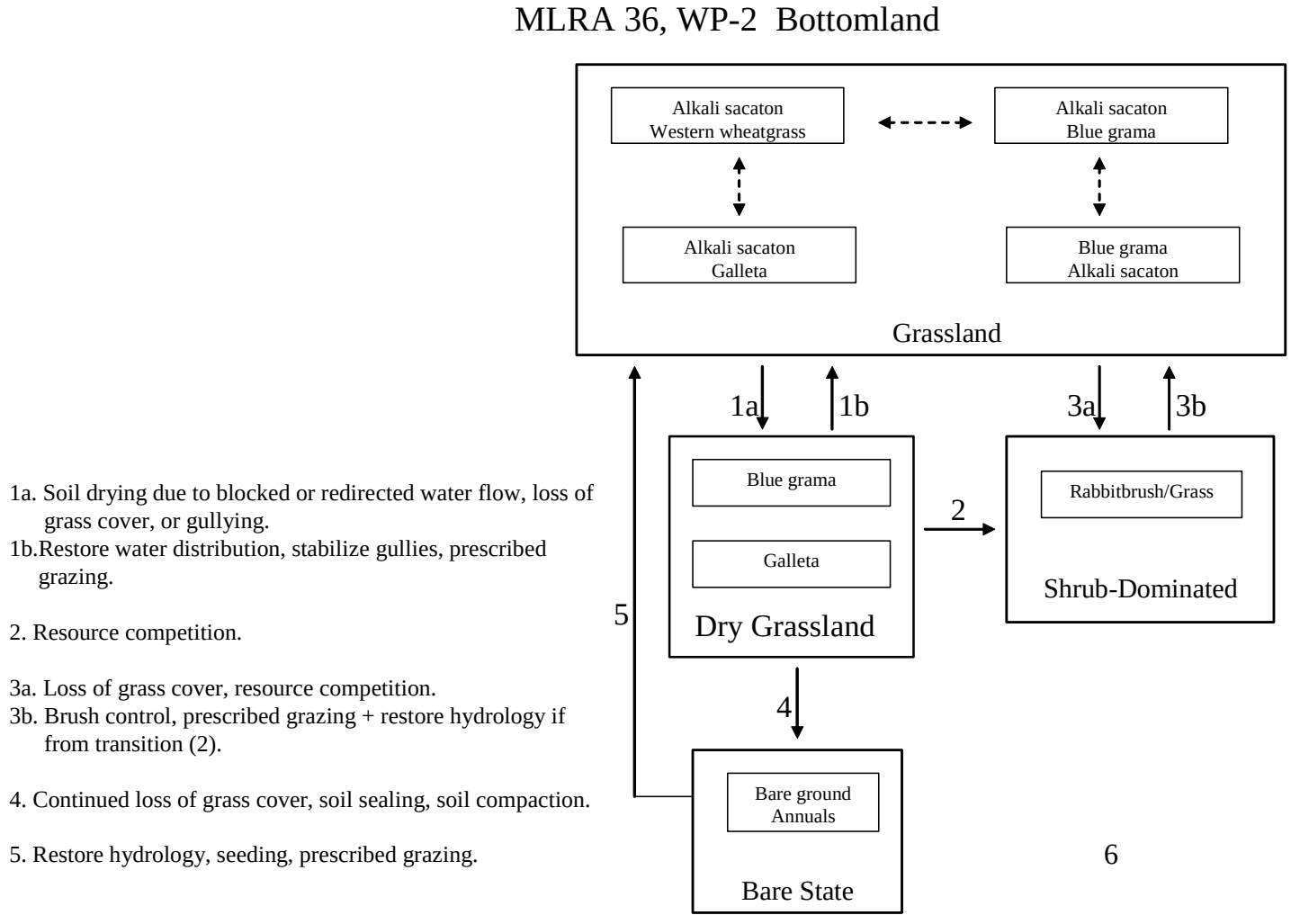
Ecological Dynamics of the Site:

Ecological Dynamics of the Site:

Overview

This site occurs on floodplains or stream terraces on valley floors. It occurs as a distinct unit or as part of a mosaic with Clayey Bottomland sites. The historic plant community of the Bottomland site is a highly productive grassland characterized by both warm and cool-season grasses, scattered shrubs, and forbs. Alkali sacaton is the dominant grass species with western wheatgrass occurring as the sub-dominant. Fourwing saltbush and rabbitbrush are common shrubs. Decreased available soil moisture due to changes in hydrology can cause a transition to a less productive Dry Grassland State. Continued loss of grass cover, soil surface sealing, or continuous disturbance may result in a state with extensive areas of bare ground (Bare State). Loss of grass cover and decreased soil moisture can increase competition by shrubs, facilitating shrub encroachment and result in a Shrub-Dominated state.

Plant Communities and Transitional Pathways (diagram)



1a. Soil drying due to blocked or redirected water flow, loss of grass cover, or gullying.
1b. Restore water distribution, stabilize gullies, prescribed grazing.

2. Resource competition.

3a. Loss of grass cover, resource competition.
3b. Brush control, prescribed grazing + restore hydrology if from transition (2).

4. Continued loss of grass cover, soil sealing, soil compaction.

5. Restore hydrology, seeding, prescribed grazing.

MLRA 36; WP-2; Bottomland

Grassland

•Alkali sacaton, blue grama with scattered 4-wing saltbush.
•Grass cover uniformly distributed
•Nuffel silt loam, McKinley Co., NM.

Grassland

•Blue grama, alkali sacaton with scattered 4-wing saltbush.
•Grass cover fairly uniform.
•Nuffel silt loam, McKinley Co., NM.

Dry Grassland transitioning to Bare State

•Galleta, ring muhly, some blue grama
•Bare Ground interconnected, with isolated grass patches.
•Soils in most bare areas are sealed over with physical crusts.
•San Mateo loam, Cibola 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 State: The historic plant community is dominated by alkali sacaton with western wheatgrass occurring as the sub-dominant. Other important grasses that typically appear on this site include blue grama, galleta, vine mesquite, spike muhly, and bottlebrush squirreltail. Fourwing saltbush is the dominant shrub. Rabbitbrush, broom snakeweed, and spineless horsebrush may also be sparsely scattered across the site. Continuous heavy grazing will cause a decrease in western wheatgrass and vine mesquite. A community dominated by alkali sacaton with blue grama or galleta as the sub-dominant may result. If the site continues to decline, blue grama may eventually dominate.

Diagnosis: Grass cover is uniform with few large bare areas present. Shrubs are scattered with canopy cover averaging six percent or less. Evidence of erosion, including pedestalling of grasses, rills and gullies is infrequent.

Ground Cover (Average Percent of Surface Area).	
Grasses & Forbs	55
Bare ground	12
Surface gravel	
Surface cobble and stone	1
Litter (percent)	30
Litter (average depth in cm.)	3
Surface Gravel (% cover)	

Plant Community Annual Production (by plant type):

	Annual Production (lbs/ac)		
Plant Type	Low	RV	High
Grass/Grasslike	1080	1890	2700
Forb	36	63	90
Tree/Shrub/Vine	300	210	120
Lichen	--	--	--
Moss	--	--	--
Microbiotic Crusts	--	--	--
Totals	1416	2163	2910

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	SPAI	Alkali sacaton	630-840	630-840
2	PASM	Western wheatgrass	420-630	420-630
3	PAOB	Vine mesquite	21-105	21-105
4	BOGR2 MUWR PLJA	Blue grama Spike muhly Galleta	210-315	210-315
5	ELEL5	Bottlebrush squirreltail	21-105	21-105
6	MURI MUWE MUTO2 ARIST SPORO	Mat muhly Creeping muhly Ring muhly Threeawns Dropseeds	21-105	21-105
7	SPWR2	Giant sacaton	21-63	21-63
8	various	Others	21-63	21-63

Plant Type - Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
9	ATCA2	Fourwing saltbush	63-210	63-210
10	ERNAN5 GUSA2	Rubber rabbitbrush Broom snakeweed	21-105	21-105
11	TECA2	Spineless horsebrush	21-63	21-63
	ARFR4	Fringed sagewort	21-63	21-63
	ARBI3	Bigelow sagebrush	21-63	21-63

Plant Type – Forb

12	2FP	Perennial forb	21-105	21-105
13	2FA	Annual forb	21-63	21-63

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 NM 0309

Growth Curve Name: HCPC

Growth Curve Description: WP-2 Bottomland HCPC Warm/Cool season perennial plant community.

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	5	12	10	15	20	25	8	5	0	0

Additional States:

Dry Grassland: This site is characterized by decreased available soil moisture. Typically galleta or blue grama is the dominant grass species. Alkali sacaton if present is generally found in clumps or tussocks with interconnected bare areas between plants, or in patches on wetter low spots.

Diagnosis: Grass cover is variable ranging from relatively uniform to patchy with large interconnected bare areas present. Blue grama or galleta is the dominant grass species. Rills, gullies, or obstructions to overland flow are present.

Transition to Dry Grassland (1a): Soil drying due to blocked or redirected flow of run-on water, loss of grass cover, or gullying are thought to initiate this transition. Water retention or diversion structures, sediment deposition, or roads may block or divert water that would naturally flow onto the site. Roads or trails may concentrate water during high flow periods and facilitate gully formation. Loss of adequate grass cover due to overgrazing can decrease infiltration, increase flow rates, and initiate gullying.

Key indicators of approach to transition:

- Reduction in western wheatgrass and alkali sacaton cover
- Increase in size and frequency of bare patches.
- Increase in cover of blue grama, galleta, ring muhly and mat muhly.
- The formation of trails, gullies or other features that disrupts natural overland flow

Transition back to Grassland (1b) The natural hydrology of the site must be restored. Erosion control structures, shaping or filling gullies, culverts, turnouts, or moving or re-routing obstructions may be necessary to restore natural run-on flow patterns. Prescribed grazing will help restore and maintain adequate grass cover.

Shrub-Dominated: This state is characterized by the predominance of shrubs, especially rabbitbrush. Spineless horsebrush and broom snakeweed may also increase in representation. Blue grama, galleta, and alkali sacaton are typically the dominant grass species, however, alkali sacaton may be sparse if the transition to this state was from the Dry Grassland.

Diagnosis: Rabbitbrush is found at increased densities relative to the Grassland state. Grass cover is patchy with large bare areas present. Evidence of erosion including pedestalling of plants, elongated water flow patterns, and litter dams is common. Rills or gullies may be present.

Transition to Shrub-Dominated (2, 3a) Loss of grass cover and resulting decreased competition by grasses is believed to initiate this transition. The loss of grass cover may be due to a change in hydrology, overgrazing, or other disturbance such as fire. Rabbitbrush is believed to increase under heavy grazing pressure[4] and after 1-3 years following fire[5].

Key indicators of approach to transition:

- 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 (3b) Brush control is necessary to initiate the transition back to the grassland state. Chemical control has been shown to be effective in controlling rabbitbrush.[1, 3] Prescribed grazing will help ensure adequate deferment period following brush control and will assist in the establishment and maintenance of grass cover. In addition the natural hydrology of the site must be restored if the transition pathway was from Dry Grassland to Shrub-Dominated (2). See Transition Back to Grassland (1b).

Bare State: Extensive areas of bare ground characterize this site. Surface soils in most bare areas are sealed over with physical crusts. Herbaceous cover consists mainly of annuals. If perennial grasses are present they occur only in isolated patches.

Diagnosis: Annuals are the dominant herbaceous vegetation. Extensive interconnected bare areas are common with scattered or no grass plants. Evidence of erosion such as rills and gullies are present.

Transition to Bare State (4) The continued loss of remaining grass cover due to overgrazing or soil drying may cause this transition. The subsequent sealing of the soil surface by physical crusts can inhibit grass reestablishment.[2] Additionally, heavy use by livestock during periods when the soils are saturated can cause trampling damage and soil compaction. Soil compaction decreases infiltration limiting grass reestablishment.

Transition back to Grassland (5) The hydrology of the site must be restored first (see 1b). Seeding may be necessary to reestablish bottomland grasses. Prescribed grazing will help restore and maintain adequate grass cover, and facilitate recovery of compacted soils. The degree to which this site is capable of recovery depends on the restoration of hydrology, the extent of degradation to soil resources, and adequate rainfall necessary to establish grasses.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:
This range site provides habitats which support a resident animal community that is characterized by pronghorn antelope, coyote, black-tailed jackrabbit, Botta's pocket gopher, sparrow hawk, mourning dove, chipping sparrow, Western spadefoot, leopard lizard, and prairie rattlesnake. The chestnut-collared longspur winters on this site, and the common raven and prairie falcon hunt over it.

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
Moriarty	B

Recreational Uses:

This site offers a limited opportunity for establishing small water area, usually of an intermittent nature, in the form of ponds or tanks. It also has potential for hiking, horseback riding, nature observation, photography, picnicking, and camping. The establishment of trails for hiking or horseback riding should be done with care, however, since frequently used trails can furnish places for natural floodwaters to channel and thus begin gullying of the site. Permanent sites for picnicking and camping are best located away from this site because of flooding hazard.

Lush vegetative growth resulting from summer flooding can cause this site to contrast sharply with those surrounding it, and natural beauty is thus enhanced.

Wood Products:

This site has little or no significant value for wood products.

Other Products:

This site is suitable for grazing by most kinds and classes of livestock with out regard to season of year. However, excessive grazing use over a prolonged period will result in a decrease in western wheatgrass, vine-mesquite and alkali sacaton. Blue grama may increase initially but will eventually decrease if heavy grazing continues and the site then becomes subject to take over by rabbitbrush and other invading woody plants, such as sagebrush or greasewood. The site is subject to gullying or draining when the natural potential vegetation is so disturbed and may not be recoverable using improved grazing management alone.

Other Information:	
Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month	
Similarity Index	Ac/AUM
100 - 76	2.0 - 2.9
75 – 51	2.7 - 4.3
50 – 26	4.0 - 7.5
25 – 0	7.5 +

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
Western wheatgrass	Pascopyrum smithii	EP	D	D	P	P	P	D	D	D	D	D	D	D
Alkali sacaton	Sporobolus airoides	EP	D	D	D	D	D	P	P	P	D	D	D	D
Vine-mesquite	Panicum obtusum	EP	D	D	D	D	D	D	D	D	P	P	D	D
Blue grama	Bouteloua gracilis	EP	D	D	D	D	P	P	P	P	P	D	D	D
Spike muhly	Muhlenbergia wrightii	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
Giant sacaton	Sporobolus wrightii	EP	D	D	D	D	D	P	P	P	D	D	D	D
Bottlebrush squirreltail	Elymus elymoides	EP	U	U	D	D	D	U	U	U	D	D	D	U
Winterfat	Krascheninnikovia lanata	EP	D	D	P	P	P	P	P	P	D	D	D	D
Fourwing saltbush	Atriplex canescens	EP	P	P	P	P	D	D	D	D	D	P	P	P

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 states:

Inventory Data References:

Data Source	Number of Records	Sample Period	State	County

Type Locality:

Relationship to Other Established Classifications:

Other References:

Data collection for this site was done in conjunction with the progressive soil surveys within New Mexico and Arizona Plateaus & Mesas Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: McKinley, Cibola, Catron, Socorro, Sandoval.

1. Cluff, G.J., B.A. Roundy, R.A. Evans, and J.A. Young. 1983. Herbicidal control of greasewood (Sarcobatus vermiculatus) and salt rabbitbrush (Chrysothamnus nauseosus ssp. consimilis). Weed Science. 31: 275-279.

2. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Physical and Biological Soil Crusts. Rangeland Sheet 7 [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

3. Whisenant, S.G. 1988. Control of threadleaf rubber rabbitbrush with herbicides. Journal of Range Management. 41: 470-472

4. Whitson, T.D. (ed.). 1999. Weeds of the West. The Western Society of Weed Science, Wyoming. pp 103

5. Wright, H. A. 1972. Shrub response to fire. In: McKell, Cyrus M.; Blaisdell, James P.; Goodin, Joe R., eds. Wildland shrubs--their biology and utilization: Proceedings of a symposium; 1971 July; Logan, UT. Gen. Tech. Rep. INT-1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station: 204-217.

Characteristic Soils Are:	
Other Soils included are:	

Site Description Approval:

Author	Date	Approval	Date
Don Sylvester	02/15/80	Don Sylvester	02/15/80

Site Description Revision:	Date	Approval	Date
Brenda Simpson	08/20/02	George Chavez	03/03/05
David Trujillo	12/16/04		