USDA Natural Resources Conservation Service

Ecological site R042BB015NM
Shallow Sandy, Desert Shrub

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R042BB012NM	**Sandy, Desert Shrub** This site often integrades with Sandy sites.

Similar sites

R042BB012NM	**Sandy, Desert Shrub** This site is similar to the Sandy ecological site but is differentiated by the shallow depth to a petrocalcic horizon.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping to undulating hill slopes, fan piedmonts, basin floors, fan remnants and fan piedmonts. Occasionally on gently rolling upland slopes. Slope range from 1 to 15 percent and average less than 9 percent. Elevations range from abut 4,000 to 5,000 feet.

They formed in old alluvial and eolian deposits from mixed sources.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Alluvial fan (3) Basin floor
Flooding frequency	None to very rare
Ponding frequency	None
Elevation	1,219–1,524 m
Slope	1–9%
Water table depth	251 cm

Climatic features

Annual average precipitation ranges from 7.35 to 11.90 inches. Wide fluctuations from year to year are common, ranging from a low of about 2 inches to a high of over 20 inches. At least one-half of the annual precipitation comes in the form of rainfall during July, August, and September. Precipitation in the form of snow or sleet averages less than 4 inches annually. The average annual air temperature is about 60 degree F. Summer maximums can exceed 100 degrees F. and winter minimums can go below zero. The average frost-free season exceeds 200 days and extends from April 1 to November 1. Both the temperature regime and rainfall distribution favor warm-season perennial plants on this site. Spring moisture conditions are only occasionally adequate to cause significant growth during this period of year. High winds from the west and southwest are common from March to June, which further tends to create poor soil moisture conditions in the springtime.

Climate data was obtained from
http://www.wrcc.dri.edu/summary/climsmnm.html

Table 3. Representative climatic features

Frost-free period (average)	205 days
Freeze-free period (average)	227 days
Precipitation total (average)	305 mm

Influencing water features

Soil features

Soils are shallow, 20 inches or less in depth. Surface textures are sandy loam, gravelly fine sandy loam, loamy sand, gravelly loamy fine sand, or occasionally gravelly clay loams. Subsurface textures are sandy clay loam, fine sandy loam, loamy fine sand, gravelly loamy fine sand, gravelly sandy clay loam, loamy sand, sandy loam or very gravelly loamy fine sand. The restrictive layer is usually indurated caliche at a shallow depth.

The soil blowing hazard becomes severe when the surface is not adequately protected by cover.

Minimum and maximum values listed below represent the characteristic soils for this site.

Characteristic soils:
Simona
Aftaden
Cave
Courthouse
Cruces
Pintura
Minlith
Elbutte

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Loamy sand (3) Gravelly fine sandy loam
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to rapid
Soil depth	10–51 cm
Surface fragment cover <=3"	0–20%
Surface fragment cover >3"	0–2%
Available water capacity (0-101.6cm)	2.54–7.62 cm
Calcium carbonate equivalent (0-101.6cm)	5–25%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm

Sodium adsorption ratio (0-101.6cm)	0–1
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.6
Subsurface fragment volume <=3" (Depth not specified)	5–35%
Subsurface fragment volume >3" (Depth not specified)	0–2%

Ecological dynamics

Overview

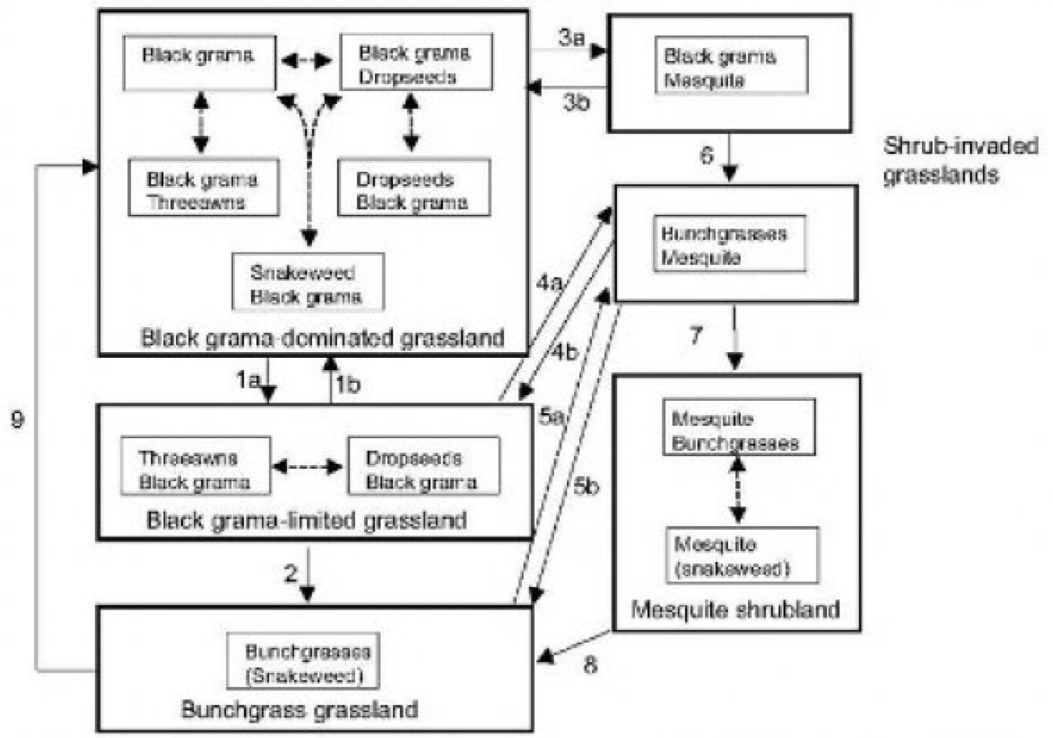
This site usually exists as a finely-scaled mosaic with the Sandy site depending on local variation to the depth of indurated caliche (petrocalcic horizon). The historic plant community type of the Shallow sandy site is dominated by black grama (*Bouteloua eriopoda*) and other grasses, especially dropseeds (Sporobolus spp.). The site differs from the Sandy site in the greater production and dominance of black grama compared to other grass species in the historic community. As in the Sandy site, black grama is a key plant of this site due to its dominance under pristine
conditions, its high forage value, and its consequent sensitivity to grazing. The nature of the states, communities, and transitions are nearly identical to the Sandy site, but the frequency with which communities are observed differs between the sites. Overall, the probability of transitions to degraded states may be lower in the Shallow sandy than
in the Sandy site due to the role of the petrocalcic horizon in maintaining water at grass rooting depth and physically impeding the progress of deeper shrub roots. Despite this effect, overgrazing and/or summer drought decreases the proportional representation of black grama and dropseeds, and threeawns (Aristida spp.) and snakeweed (Xanthocephalum spp) tend to increase in abundance. Shifts away from black grama dominance are thought to be due to overgrazing and/or multi-year periods of summer drought, or due to the introduction of honey mesquite (*Prosopis glandulosa*) seeds with or without grazing. With continuous heavy grazing, the proportional
representation of black grama declines because it is preferred by cattle over dropseeds, threeawns and snakeweed (Paulsen and Ares 1962). Dropseeds are more palatable than threeawns, so dropseeds may also decline relative to threeawns and snakeweed. Under climatic conditions that are not conducive to black grama reproduction, or due to some degree of soil degradation, demographic limitations may lead to persistent absence of black grama, even without shrub invasion. Shrub invasion is, however, very common. Loss of soil stability and/or a reduction in black
grama cover may permit either the survival or establishment mesquite seedlings due to reduced competition or fire frequency. Subsequent grazing by by livestock and native herbivores, competition from shrubs, erosion, and concentration of nutrients under adult shrubs eventually leads to peristent reductions of grass cover and mesquitedominated coppice dunes with bare or snakeweed-dominated interdunal areas. The large (2-3 m tall)

coppice dunes observed in the Sandy site are not observed, due to the restriction imposed on erosion by the shallow caliche layer.

The nature of the information reported for the Sandy site also applies to this site. All of the work has been carried out in the Chihuahuan Desert Rangeland Research Center (College Ranch) of New Mexico State University and the Jornada Experimental Range. It should be noted that in many instances, soils of plots on the Jornada identified as Simona-Harrisburg association (Dona Ana County Soil Survey) belong to both the Sandy and Shallow sandy ecological site. Soil trenches excavated on the Jornada indicate that the alternation between conditions characteristic of each these ecological sites occurs on the scale of meters. Thus, it is difficult to associate many studies to a single ecological site in this area. Exceptions may include the studies of Hennessy et al. (1983a), Fusco et al. (1995), Warren et al. (1996), and Gibbens et al. (1992).

State and transition model

State-Transition model: MLRA 42, SD-2, Upland sandy site group: Shallow sandy



1a. Climate change and/or overgrazing, moderate soil degradation. **1b.** Restoration of soil fertility (if climate not involved)
2. Extinction of black grama, severe soil degradation.
3a. Introduction of mesquite seeds, reduced grass competition, lack of fire. **3b**.Shrub removal, restoration of fuel loads and fire.
4a, **5a**. Mesquite invasion. **4b**, **5b**. Shrub removal, restoration of fuel loads and fire.
6a. Black grama extinction due to mesquite competition and grazing. **6b.** Shrub control with black grama restoration.
7. Continued grass loss (e.g. overgrazing), inter-shrub erosion, soil fertility loss, high soil temperatures, small mammal herbivory. **8**. Dune destruction, mesquite removal, soil stabilization, nutrient addition, seeding during wet periods.
9. Reseeding, replanting with restoration of soil fertility.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

State Containing the Historic Climax Plant Community Black grama-dominated grassland: The historic plant community is dominated primarily by black grama and secondarily by dropseeds (*Sporobolus flexuosus*, *S. cryptandrus*). Because shallow caliche maintains water within the root zone of grasses longer than deeper caliche, and because caliche may store and slowly release water (Hennessy et al. 1983b), grass production is generally greater than in the Sandy site. Threeawns (Aristida spp.) occur but in lower frequency than dropseeds. Bush muhly (*Muhlenbergia porteri*) is less common than in the Sandy site. Winterfat (*Krascheninnikovia lanata*) can be the most common woody plant and soaptree yucca (*Yucca elata*), longleaf ephedra (*Ephedra trifurca*), fourwing saltbush (*Atriplex canescens*), and snakeweed are common. This state is defined by the capacity of black grama to persist indefinitely. Through its high basal cover, high litter cover, and consequent low rates of erosion and high infiltration rates, black grama can regenerate by both seeding and tillering. Fires may or may not be frequent (see discussion in Sandy model). If the climate hypothesis is correct, then this state may not now exist anywhere in SD-2, except during ephemeral periods suitable climate. Mesquite cannot be present in this state. Retrogression within this state caused by grazing is characterized by an increasing relative abundance of threeawns or snakeweed in most cases. Two seasons without summer rains will also lead to black grama decline (Gibbens et al., in press). Snakeweed or threeawns may become dominant within this state as long as the capacity of black grama to recover after cessation of grazing is not compromised. Gibbens and Beck (1987) and some unpublished records from the USDA-ARS Jornada Experimental Range, Las Cruces, NM provide evidence for recovery of black grama from dropseed dominance at a local scale (1 m2). Campbell and Bombarger (1934) indicate that black grama can recover within snakeweed-dominated grassland. Diagnosis: Black grama is very dominant and cover is continuous. There is evidence of black grama reproduction by seed and stolon. Large gaps (< 1 m) are very few. Litter cover is abundant. There is no mesquite. Transition to black-grama limited state (1a): Climate change (see Information sources and theoretical background) or damage to black grama and loss of soil fertility by grazing, trampling, and moderate erosion may cause this transition. Gibbens et al. (in press) note that two summers without rain will kill black grama plants, so drought in combination with selective grazing on black grama may cause its extinction. Wright and Van Dyne (1976) note that the effects of cattle trampling may be more important than the effects of grazing per se. Furthermore, those authors found an effect of grazing on only loamy sands suggesting that relatively minor variations in soil texture may determine the sensitivity of black grama to grazing. Herrick et al. (2001) suggest that loss of litter cover, plant cover, and perhaps cryptogamic crust leads to soil degradation that creates an unfavorable environment for black grama. In particular, the loss of mycorrhizal fungi required by black grama may be an important mechanism (ongoing research by Laurie Abbott, NMSU, and Jerry Barrow, USDA-ARS Jornada Experimental Range). Increases in threeawns seem to be an especially ominous indicator of a transition, although it is unclear why. According to the review by Tirmenstein (1987), *Aristida purpurea* is favored by winter-spring precipitation, is animal dispersed, is disturbance-adapted, and is usually unpalatable. Thus, the variety of processes postulated to reduce black grama may all favor this grass. Key indicators of approach to transition: Increases in bare ground, decreases in litter cover and black grama cover, decreased soil surface resistance to erosion, decreases in soil organic matter and microbiotic populations, increases in threeawns. Transition to the shrub-invaded state (3a): Once shrubs invade and/or begin to grow to maturity, this transition has occurred. Many investigators believe that shrub invasion is initiated by reductions in black grama, but Herbel and Gibbens (1996) suggest that mesquite invasion can occur within apparently intact black grama stands. It is possible that the latter pattern emerges when the propagule load to an intact site is very high due its proximity to a mesquite-invaded site. Alternatively, mesquite propagules may usually be present as seeds but are able to achieve maturity in the absence of fire. If the competition hypothesis is true, loss of soil stability and selective herbivory on black grama with continued grazing may promote the growth and expansion of mesquite within this state. If the fire hypothesis is true, then the reduction of fire frequency associated with the loss of fine fuels is the cause for the transition. If the small animal shrub herbivory hypothesis is true, then the elimination or reduction of mesquite seedling predators is the cause, independent of grass cover. If none of these hypotheses are true, then once introduced, mesquite may expand despite cessation of grazing. It is likely that several of these processes work in parallel or in different instances. Key indicators of approach to transition: Same as for transition 1a if the competition hypothesis is true. If the fire hypothesis is true then a reduction of black grama annual production and litter cover are indicators. If the dispersal hypothesis is true then there are no suitable indicators, other than the presence of potential seed vectors (i.e. livestock) and their connection to a seed source (a mesquite-invaded area).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	288	454	620
Shrub/Vine	47	75	102
Forb	29	45	63
Total	**364**	**574**	**785**

Figure 5. Plant community growth curve (percent production by month). NM2506, R042XB015NM-Shallow Sandy-Warm Season Plant-HCPC. SD-2 Warm Season Plant Community.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	10	25	30	15	5	0	0

State 2
Black grama Limited Grassland

Community 2.1
Black grama Limited Grassland

Additional States: Black grama-limited grassland: Communities in this state may be structurally indistinguishable from the black grama-dominated grassland. Black grama may dominate but will not show evidence of reproduction by seed and perhaps stolons. If the climate hypothesis is correct, then areas with a high cover of black grama can belong to this state. More typically, directional change via grazing or individual replacement will have already occurred, and black grama will be reduced to a subordinate component of the plant community and bunchgrasses, largely threeawns, may dominate. Snakeweed, fluffgrass (*Dasyochloa pulchella*) and annuals are also important components and may dominate. Snakeweed dominance seems more prevalent in this site than the Sandy site, perhaps due to the limitations imposed by the shallow petrocalcic horizon on deep-rooting shrubs. Snakeweed may achieve dominance because it is less palatable than the grasses. Furthermore, once snakeweed attains a high density, allelopathic (Tirmenstein 1999) or competitive effects may inhibit the growth of grass populations. Jameson (1970), however, failed to document any competitive suppression of snakeweed on black grama. Climate (Campbell and Bombarger 1934), fire (McDaniel et al. 2000) and beetle herbivory (Crossidius spp.; Thompson et al. 1996) may regulate patterns of snakeweed abundance. Because snakeweed is a cool-season plant, it tends to increase in response to increases in winter-spring precipitation. Diagnosis: Black grama cover is usually lower than that of bunchgrasses. There is no evidence of black grama reproduction by seed and stolon production. Mesquite is absent or rare. Transition to bunchgrass grassland (2): This is caused by the local extinction of black grama due to grazing, loss of soil fertility, drought, or other disturbance. Key indicators of approach to threshold: Decadence of black grama, pedestalling or sand burial of black grama plants, lack of reproduction. Transition to shrub-invaded grassland (4a): Mesquite propagules may be introduced to a system some time after black grama reproduction has become limited and/or black grama dominance declines. Environmental conditions are likely to be suitable for mesquite establishment within the black-grama limited state. Thus, only the presence of a mesquite-seed vector is required for this transition to take place. Key indicators of approach to threshold: There are no suitable indicators, other than the presence of potential seed vectors (i.e. livestock) and their connection to a seed source (a mesquite-invaded area). Transition to black grama-dominated grassland (1b): Black grama has been observed to survive in certain patches on the Jornada Experimental Range through the drought periods (Gibbens et al., in press). Understanding what properties distinguish these patches from areas where black grama has declined may hold important clues to preventing grassland degradation and restoring black grama. Methods for reversing the transition are currently unknown, and might require restoration of soil fertility.

State 3

Bunchgrass Grassland

Community 3.1
Bunchgrass Grassland

Bunchgrass grassland: This state is characterized by a lack of black grama and dominance by bunchgrasses (threeawns or dropseeds) or snakeweed. Diagnosis: Absence of black grama plants. Mesquite is absent or rare. Transition to shrub-invaded grassland (5a): As for transition 4a above. Transition to black grama-dominated grassland (9): Restoration techniques are unknown, but may require soil stabilization, restoration of soil fertility, and reintroduction black grama seeds.

State 4
Shrub-Invaded Grasslands

Community 4.1
Shrub-Invaded Grasslands

Shrub-invaded grasslands: Communities in this state can be distinguished from either black grama-dominated, black grama-limited, or bunchgrass grasslands by the presence of honey mesquite. In some cases, mesquite can invade otherwise healthy-looking black grama grassland that may catalyze or co-occur with events leading to black grama loss. In other cases, mesquite has invaded after significant black grama degradation has occurred and bunchgrasses may coexist with mesquite over the long term. It is believed that black grama loss (transition 6a) and possibly a transition to mesquite dunes (transition 7), eventually occurs without grazing rest and shrub control (e.g. Hennessy et al. 1983). Mesquite plants may be very small and difficult to detect. Although fire may kill small (< 1.5 yr old; Wright et al. 1976) mesquite, it is unlikely that fire frequencies will be sufficiently high to remove mesquite from a grassland once a source of mesquite propagules has been connected to a grassland. It is possible that mesquite seedlings are a normal component of black-grama dominated grassland but are suppressed by fire, small mammal herbivory, and/or competition in the black grama-dominated state (Brown and Archer 1999). Through either the exogenous effects of climate change or disturbance, or the endogenous effects of mesquite dominance, it is most common to observe a reduction in black grama reproduction coincident with mesquite increase (bunchgrasses/mesquite). There are no data available that relate grass reproduction to levels of invasion. Valentine (1936), however, indicates that beyond a height of 1-2 feet, mesquite begins to exclude grasses from around plant bases although it is unclear why. Mesquites may provide cover and nest sites for rodents (e.g. kangaroo rats) and lagomorphs (jackrabbits, cotton-tails) that increase herbivory on black grama adults and seedlings (ongoing research, Deb Peters and Brandon Bestelmeyer, USDA-ARS Jornada Experimental Range). If black grama reproduction is limited, it may be rapidly extirpated with grazing and interactions with shrubs and only bunchgrasses may remain to maintain soil stability. Twenty years after herbicidal shrub-control measures on Simona-Cruces soils, however, only minor differences in black grama cover could be attributed to the 7% reduction in mesquite cover. Diagnosis: Mesquite are present and usually conspicuous. Black grama cover may be substantial with areas around shrubs devoid of grass (Black grama/mesquite), or it may be rare to absent (bunchgrasses/mesquite). Transition to bunchgrasses-mesquite state (6): Grazing, drought, rodent activities, and competition with shrubs may drive black grama to a subordinate status or extinct. Alternatively, this transition may occur solely due to processes associated with the presence of mesquite, and thus will eventually occur unless mesquite are removed. Key indicators of approach to threshold: Decadence of black grama, pedestalling of black grama plants, lack of reproduction. Transition to mesquite shrubland state (7): This transition results in the largest change in ecosystem functioning in the site. Once grass cover is reduced below some amount and/or soil-surface disturbances due to cattle trampling reduce soil surface stability and infiltration, eolian and sheet erosion will create a transition to the mesquite shrubland state. The exposure and weathering of the petrocalcic horizon is usually observed. Key indicators of approach to threshold: Continued loss of grass cover, biotic soil crusts, and evidence of increased bare ground and erosion (e.g. the accumulation of caliche chunks and stones at the surface) indicate movement toward threshold. Pedestalling, blowouts, ripples in sand, soil surface loss will be evident. Transition to black grama-dominated, limited, or bunchgrass grassland (3b, 4b, 5b): Mesquite removal by application of herbicides, grass recovery and recovery of suitable fuel loads, and reinitiation of historic fire frequencies if the fire hypothesis is true. Attention to fuel load, continuity, and fire timing and frequency may be important if fire prevented mesquite expansion. The successful use of fire in black grama grasslands, however, depends strongly upon the size of mesquite and probably on post-fire precipitation patterns that favor black grama recovery (Drewa and Havstad 2001). At this point, it is unclear if fire can be effectively used as a management tool to promote black grama dominance. If the competition hypothesis is true, then simply reestablishing grass cover would be sufficient. Both of these approaches are unlikely to be supported in black-grama limited or bunchgrass grasslands, which generally exhibit low production and cover. If climate or mesquite seed availability alone is responsible for transitions 3a, 4a, or 5a, transitions to grasslands may be impossible to bring about.

State 5
Mesquite Shrubland

Community 5.1
Mesquite Shrubland

Mesquite shrubland: Continued reduction of grasses, or invasion of snakeweed dominated areas by mesquite, accelerates eolian and sheet erosion, reducing soil fertility in shrub interspaces and redistributing nutrients to the bases of shrubs (see the nutrient redistribution hypothesis in Sandy site; Overview: Information sources and theoretical background). Eventually, much of the soil A horizon is removed from shrub interspaces and a hardpan B horizon or petrocalcic horizon may be exposed there. Grass (or shrub) establishment on this surface may be impossible but in many cases snakeweed persists alongside mesquite shrubs. Soil accumulates around the bases of shrubs coincident with the deflation of soil in shrub interspaces. This process results in the formation of hummocks. These hummocks are not as large as those observed in the Sandy site. Dropseeds and snake weed may or may not occur in the interspaces depending upon the depth to a restrictive layer. Often, grasses (mostly dropseeds) and other shrubs, especially saltbush (*Atriplex canescens*), colonize dunes because of the greater availability of water there (Hennessy et al. 1985). Creosotebush (*Larrea tridentata*) may also dominate these shrublands where gravel content is high. Diagnosis: Mesquite is dominant. It often eventually forms low coppice dunes from 0.5-1 m high in the latter stages of development. Black grama and bunchgrasses may be absent and if present are often restricted to dunes. Snakeweed and a few bunchgrasses may occur in interdunes if an impermeable horizon has not been exposed. There is often evidence of eolian soil erosion including pedestalling, sand ripples and exposed caliche. Transition to bunchgrass grassland (8): In principle, it may be possible to kill mesquite, redistribute or add soil nutrients, and stabilize soil during periods favorable to the germination of bunchgrasses, perhaps in conjunction with seeding. The use of municipal biosolids may aid in restoring soil fertility (Walton et al. 2001). Information sources and theoretical background: Communities , states and transitions are derived largely from the literature including Buffington and Herbel (1965), Herbel et al. (1972), Gibbens and Beck (1987), Hennessy et al. (1983a), and Herbel and Gibbens (1996). Background information on the causes of transitions is presented in the Sandy site model. Much of the discussion below is the same as that presented in the Sandy model, and contrasts are drawn where information is available.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season**			230–287	
	black grama	BOER4	*Bouteloua eriopoda*	230–287	–
2	**Warm Season**			6–29	
	bush muhly	MUPO2	*Muhlenbergia porteri*	6–29	–
3	**Warm Season**			57–86	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	57–86	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	57–86	–
4	**Warm Season**			6–29	
	tobosagrass	PLMU3	*Pleuraphis mutica*	6–29	–
5	**Warm Season**			17–29	
	threeawn	ARIST	*Aristida*	17–29	–
6	**Warm Season**			6–17	

	low woollygrass	DAPU7	*Dasyochloa pulchella*	6–17	–
7	**Warm Season**			6–17	
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	6–17	–
8	**Warm Season**			0–29	
	blue grama	BOGR2	*Bouteloua gracilis*	0–29	–
9	**Warm Season**			6–29	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	6–29	–
Shrub/Vine					
10	**Shrub**			6–17	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	6–17	–
11	**Shrub**			6–17	
	fourwing saltbush	ATCA2	*Atriplex canescens*	6–17	–
12	**Shrub**			6–29	
	longleaf jointfir	EPTR	*Ephedra trifurca*	6–29	–
	soaptree yucca	YUEL	*Yucca elata*	6–29	–
13	**Shrub**			17–46	
	winterfat	KRLA2	*Krascheninnikovia lanata*	17–46	–
Forb					
14	**Forb**			29–57	
	dwarf desertpeony	ACNA2	*Acourtia nana*	29–57	–
	desert marigold	BAMU	*Baileya multiradiata*	29–57	–
	croton	CROTO	*Croton*	29–57	–
	redstem stork's bill	ERCI6	*Erodium cicutarium*	29–57	–
	buckwheat	ERIOG	*Eriogonum*	29–57	–
	woolly paperflower	PSTA	*Psilostrophe tagetina*	29–57	–
	Russian thistle	SAKA	*Salsola kali*	29–57	–
15	**Forb**			6–17	
	horsetail milkweed	ASSU2	*Asclepias subverticillata*	6–17	–
	milkvetch	ASTRA	*Astragalus*	6–17	–
	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	6–17	–
16	**Annual Forb**			6–29	
	Forb, annual	2FA	*Forb, annual*	6–29	–

	Forb, annual	2FA	*Forb, annual*	6–29	
17	**Perennial Forb**			6–29	
	Forb, perennial	2FP	*Forb, perennial*	6–29	–

Animal community

This site provides habitat which support a resident animal community that is characterized by pronghorn antelope, kit fox, hooded skunk, desert cottontail, desert pocket gopher, desert pocket mouse, ord kangaroo rat, roadrunner, scaled quail, meadowlark, prairie rattlesnake and little striped whiptail.

Where woody vegetation is present, this site serves as a breeding area for mourning dove and mocking bird.

Hydrological functions

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

Hydrologic Interpretations
Soil Series Hydrologic Group
Simona D
Cruces D
Aftaden D
Cave D
Courthouse D
Pintura A
Minlith D
Elbutte

Recreational uses

Suitability for camping and picnicking is fair, and hunting is fair for pronghorn antelope, quail, dove, and small game. Photography and bird-watching can be fair to good, especially during migration seasons. Most small animals of the site are nocturnal and secretive, seen only at night, early morning or evening. Scenic beauty is greatest during spring and sometimes summer months when flowering of forbs, shrubs, and cacti occurs.

Wood products

This site has no significant value for wood products.

Other products

This site, at its potential, is suitable for grazing in all seasons of the year, although most of the green froage is produced during the summer months. The site is suitable for cattle, sheep, goats, and horses, generally without regard to class of animals. Site deterioration caused by inadequate grazing management is characterized by the decrease of such plants as black grama, bush muhly, fourwing saltbush, and winterfat. These plants are replaced by such plants as threeawns, fluffgrass, dropseeds, and annuals. Substantial stands of broom snakeweed may be a sign of serious retrogression, as well as invasion by mesquite. A reasonably rapid rate of recovery can be effected, however, through good grazing management and, when needed, mesquite control.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM
100 - 76 3.5 – 4.7
75 – 51 4.5 – 6.5
50 – 26 6.0 – 10.5
25 – 0 10.5 - +

Other references

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. This site has been mapped and correlated with soils in the following soil surveys. Sierra County Dona Ana County Grant County Hidalgo County Luna County Otero County

Characteristic Soils Are:
Simona fine sandy loam
Cruces fine sandy loam
Simona loamy fine sand
Cruces loamy fine sand

Other Soils included are:
Minlith gravelly loam y fine sand
Tonuco loamy fine sand

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**