Ecological site R042BB014NM
Loamy, Desert Shrub

Accessed: 05/18/2024

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

R042BB010NM	**Gravelly, Desert Shrub** The Loamy site often intergrades with Sandy, Clayey, Gravelly, and Gravelly Loam sites.
R042BB012NM	**Sandy, Desert Shrub**
R042BB023NM	**Clayey, Desert Shrub**
R042BB035NM	**Gravelly Loam, Desert Shrub**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on level to gently sloping fan piedmont, alluvial fans, fan remnants or flood plains and derived from igneous and sedimentary sources. Slopes range from 1 to 15 percent, averaging less than 5 percent. Elevations range from about 3800 to 5000 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Alluvial fan (3) Fan remnant
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Very rare to occasional
Ponding frequency	None to rare
Elevation	1,158–1,524 m
Slope	1–15%
Water table depth	251 cm
Aspect	Aspect is not a significant factor

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

This site is not influenced by wetland or streams.

Soil features

Soils are moderately deep to deep. Surface textures are loam, sandy loam, silty loam, gravelly sandy loam, gravelly loam, very fine sandy loam, gravelly clay loam. Subsoil textures are loam, sandy loam, silty loam, gravelly sandy loam, gravelly loam, very fine sandy loam, gravelly clay loam, silty clay loam, sandy cly loam. Substratum textures are loam, sandy loam, silty loam, gravelly sandy loam, gravelly loam, very fine sandy loam, gravelly clay loam, silty clay loam, sandy cly loam.

Some of these soils may have a seasonal watertable due to subirrigation.

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

Characteristic soils:

Frye
Gila
Mohave
Tres Hermanos
Harkey
Stellar
Mimbres
Mcnew
continental
Dona Ana
Adelino
Tome

Table 4. Representative soil features

Surface texture	(1) Sandy clay loam (2) Loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to moderate
Soil depth	61–183 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	10.16–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	5–40%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–1
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–3%

Ecological dynamics

Overview:

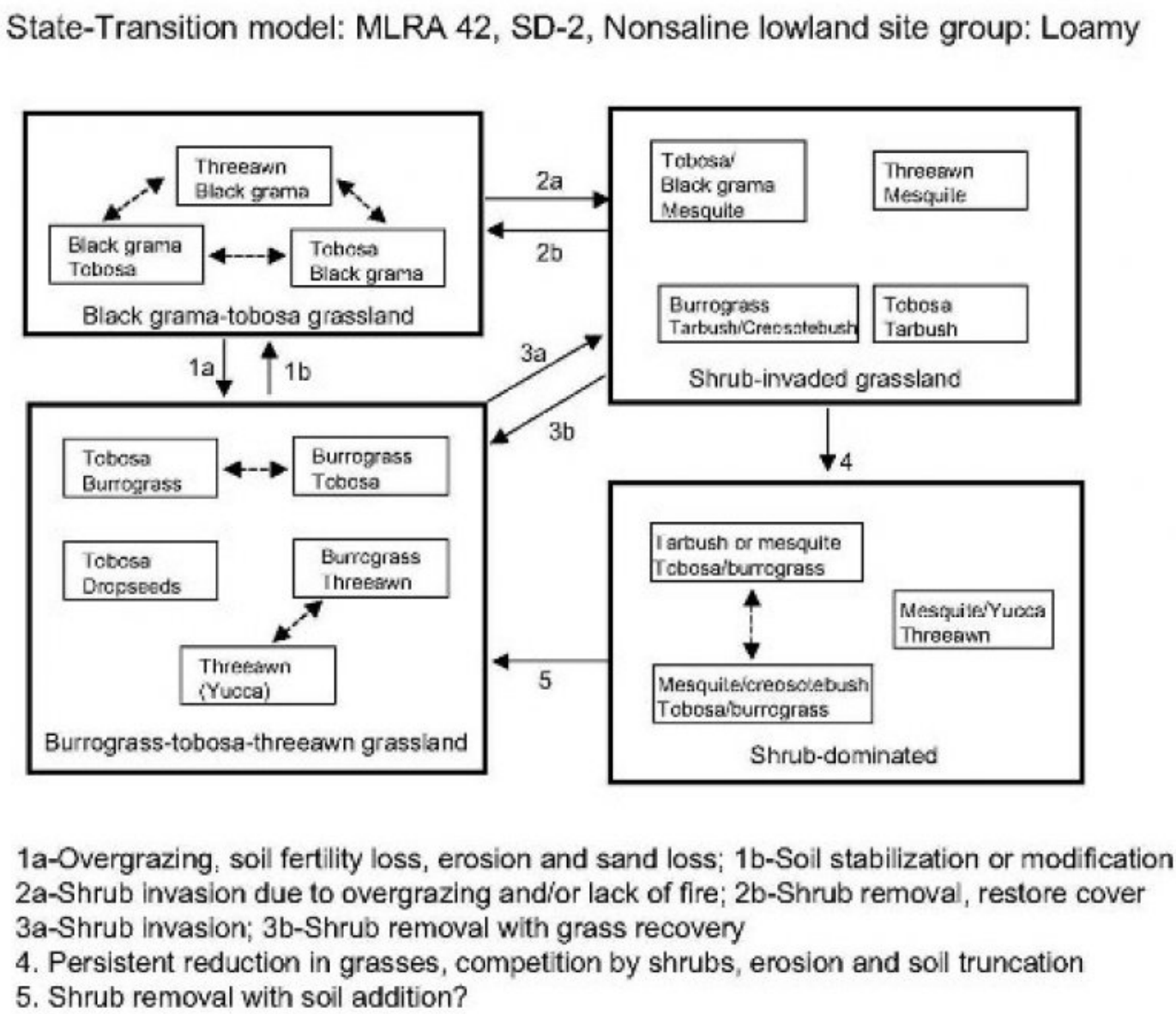
Floristically, this ecological site is can be viewed as a “tension zone” (Curtis 1959) between sandy upland sites and clayey lowland sites, reflecting the intermediate character of the soil texture. At tension zones, species diversity is often high and slight differences in environmental conditions can produce large changes in community structure. This may partly explain why there are such substantial differences in plant composition among soil series within this site. It is often at the center of an ecological gradient where classification systems are least satisfying, and this ecological site is no exception. On the other hand, research conducted on variation in plant assemblages on loamy soils can provide important information on the niches of many plants in SD-2.

This site intergrades with Sandy, Clayey, and Gravelly or Gravelly loam sites and does not often form sharp boundaries with them. The presumed historic plant community type of this site is dominated by black grama (*Bouteloua eriopoda*) and tobosa (*Pleuraphis mutica*) is a secondary dominant, followed by alkali sacaton (*Sporobolus airoides*). No areas harboring this community have been located, and only one area on the Jornada Experimental Range harbors substantial amounts of black grama. These areas tend to be on sandier soils, so the relative dominance of black grama and tobosa in the historic setting may depend on variations in surface or subsurface soil texture. Transitions within this ecological site appear to be governed by selective herbivory, erosion and soil truncation, although no systematic studies within this site exist. A loss of black grama, with subsequent dominance by burrograss (*Scleropogon brevifolius*), tobosa, or threeawns (Aristida spp.) may occur in response to grazing. Both tarbush (*Flourensia cernua*) and honey mesquite (*Prosopis glandulosa*) readily invade this site, perhaps facilitated by bare areas where grass competition and/or fire is diminished. Creosotebush (*Larrea tridentata*)
may also invade. Subsequent loss of remaining grass cover, erosion, and soil truncation eventually produces a shrubland state (often dominated by tarbush or creosotebush) with little grass cover.

No quantitative information exists concerning the causes of transitions between grassland types and to

shrubinvaded
grasslands or pure shrublands in this ecological site.

State and transition model



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

Figure 4. MLRA 42; SD-2; Loamy

State Containing Historic Climax Plant Community Black grama-tobosa grasslands: This state is now rare throughout SD-2. On Berino fine sandy loam soils west of Las Cruces (the Corralitos Ranch), a tobosa-black grama community occurs in which tobosa is the overwhelming dominant and black grama is restricted to small patches. In other settings (e.g. the Jornada Experimental Range), black grama appears to have colonized where sand has blown onto silt loam soils. Dominance by black grama, however, has not been observed on soils classified to this site. Other than tobosa and black grama, alkali sacaton is a relatively consistent feature of this site. Threeawns or dropseeds (Sporobolus spp.) may achieve dominance or subdominance depending upon variation in soil texture and natural disturbances. On more gravelly soils, bush muhly (*Muhlenbergia porteri*) cover may be significant. In any case, the historic community was probably extremely diverse due to the intermediate nature of this site along the gradient of soil texture. Grazing-induced retrogression would be expected to reduce this diversity and to severely reduce the dominance of black grama. Subordinate species of lower palatability and higher tolerance to disturbance, including tobosa and threeawns, would be expected to attain dominance. As long as sufficient black grama cover persisted and climatic conditions favored black grama reproduction, then recovery would be possible. Diagnosis: Ranging from near co-dominance between black grama and other grasses to the representation of black grama in isolated patches. Mesquite, tarbush, and creosotebush are absent. Signs of erosion, including gullies, rills, and litter movement are infrequent. Transition to burrograss-tobosa-threeawn grassland (1a): Grazing and/or drought may limit the growth of black grama (see also transition 1, Sandy model). Disturbance to individual black grama plants due to trampling or other physical disturbance may be especially important. Key indicators of approach to transition: Loss of grass species diversity, reduction in black grama cover and increased decadence of black grama plants, decreases in overall grass cover coincident with increases in the relative cover of burrograss, tobosa and/or threeawns, increases in bare patch size. If climate is not favorable for black grama reestablishment, the transition may be inevitable. Transition to shrub-invaded state (2a): Mesquite invasion may be due to introduction by cattle or humans (see Sandy model), although tarbush and creosotebush are wind-dispersed. Surfacesoil disturbance, reduced grass cover, and the presence of large bare patches may facilitate the germination of seeds of all shrubs. This mechanism assumes that shrub invasion is coincident with grazing-induced loss of grass (black grama) cover, as is the case on the Jornada Experimental Range. The reduction of periodic fire in conditions where black-grama/tobosa grasslands have sufficient grass production (e.g. >600 lbs/acre; Wright et al. 1976) may also have facilitated shrub invasion. These factors may be independent of management (Herbel and Gibbens 1996) if climate has played a large role. Key indicators of approach to transition: Same as for 1a if mesquite is limited by

competition with grasses, in addition to the presence of maturing shrubs. If fire is important, then a persistent reduction in production and litter cover coincident with reduced fire frequencies may portend shrub invasion.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	276	448	621
Shrub/Vine	34	55	75
Forb	27	44	61
Total	**337**	**547**	**757**

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	25%
Forb basal cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	15%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	50%

Figure 6. Plant community growth curve (percent production by month). NM2505, R042XB014NM-Loamy-Warm Season Plant -HCPC. SD-2 Loamy HCPC 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
Burrograss-Tobosa-Threeawn Grassland

Community 2.1
Burrograss-Tobosa-Threeawn Grassland

Additional States: Burrograss-tobosa-threeawn grassland: There are many communities within this state due to the sensitivity of species to slight variations in soil conditions, or perhaps due simply to chance colonization. The state is characterized by the reduced ground cover of grasses overall and low cover of black grama in particular. On eroded sandy ridges (e.g Algerita, sandy loam, eroded phase), threeawns, yucca (*Yucca elata*), and fluffgrass (*Dasyochloa pulchella*) may dominate. In some cases, alkali sacaton may dominate; it is unclear why (but perhaps related to salinity). Local variation in grass densities may occur depending on microtopography or soils. On siltier and/or more calcareous soils, burrograss may be dominant (perhaps without disturbance). On heavier soils with higher run-in water such as Algerita sandy clay loam, tobosa may dominate. In some cases, annual grass and forb species may be especially abundant. On slight (< 1°) slopes, erosional-depositional vegetation banding (Mauchamp et al. 1990) may be apparent, with bare strips being a prominent feature (e.g. Algerita sandy loam; Gile and Grossman 1997). This pattern may be initiated by disturbance to vegetation and is maintained through positive feedbacks. The extent of the bare area may not increase over time, although the bare areas may shift upslope. Diagnosis: Black grama low to absent. Other perennial grasses including tobosa, burrograss, and threeawns ranges

are dominant. Cover of perennial grasses and litter is discontinuous, bare areas are interconnected. Signs of erosion may be present. Transition to shrub-invaded state (3a): See transition 2a above. Communities dominated by burrograss are unlikely to have sufficient fuel to carry fire. Thus, the presence of shrub propagules at a site may be all that is required for this transition. Transition to black grama-tobosa grassland (1b): If climate is responsible for black grama decline, then this transition may be impossible to manipulate. May require soil amendments to increase fertility for black grama (i.e. restoration of mycorrhizal associates). Very little is known about the constraints to the presence and dominance of individual grass species.

State 3
Shrub-Invaded Grassland

Community 3.1
Shrub-Invaded Grassland

Shrub-invaded grassland: This state usually features a substantial amount of shrub cover, although in some cases, a savanna-like aspect with abundant grass (e.g. tobosa/mesquite community) can persist for long periods. Different shrubs have a tendency to invade depending on variations in soil texture—mesquite invades more often on more coarse variants (e.g. sandy loams over sandy clay loam or clay loam B horizons; tobosa or threeawn/mesquite communities) with low carbonate and tarbush and creosotebush are dominant shrubs where surface layers are finer (sandy clay loams, fine sandy loams) and soils with higher carbonate (such as the carbonate-rich Reagan soils). Tarbush may do especially well on silt-loam soils, although this has not been quantified. Creosotebush frequency increases as gravel content increases (e.g. > 5%; David Trujillo, NRCS, personal communication). Mesquite exhibits a more inverted-conical growth form on loamy soils relative to sandier soils, perhaps due to the lack of sand accumulation around shrub bases. Grass cover is often (but not always) substantially lower than in the grassland state and is patchy. It is possible that accelerating practices (shrub control) are needed to maintain a shrub-invaded state. While in the shrub-invaded state, tobosa and bush muhly have been reestablished as dominants in response to herbicide application on creosotebush and tarbush on Dona Ana sandy loam soils in the Jornada Experimental Range (Herbel et al. 1983). Diagnosis: Shrubs, including mesquite, tarbush, and/or creosotebush are present. The cover of perennial grasses, including tobosa, burrograss, and threeawns, ranges from interconnected to patchy but large (> 2 m) bare patches are usually common. Black grama may be present but is rare (so far as we have observed). Transition to shrub-dominated state (4): Continued grazing or drought may lead to the loss of remaining grasses, sheet erosion or gullying, and soil truncation and soil drying. This prevents further establishment by grasses or shrubs in most areas. Soil surface physical crusting may also be important. Some shrubs (e.g. creosotebush) may expand via clonal growth. Furthermore, competition by shrubs for water at grass rooting depths (see Gibbens and Lenz 2001) may lower grass survival and reproduction. Shrub encroachment alone may produce these changes without grazing such that this transition occurs if shrub removal is not applied (see Sandy model). Key indicators of approach to transition: Increases in shrub cover and/or density, loss of grass cover, biotic soil crusts, increased bare ground and bare ground patch sizes, evidence of increasing erosion including litter movement, rills, gullies, and pedestalling of grasses and shrubs. Presence of physical soil crusts. Transition to shrub-dominated state (2b). Shrub removal with increases in grass cover and fuel loads for fire may be required to reestablish the competitive dominance of grass or to facilitate periodic disturbances to shrubs. It is more likely, however, that the conditions promoting shrub invasion will remain in place such that fire and shrub control must be continually applied, perhaps at frequencies and under conditions not conducive to grass recovery. In any case, the utility of fire to maintain grassland cover in SD-2 is unknown and is currently being investigated (Drewa and Havstad 2001).

State 4
Shrub-Dominated

Community 4.1
Shrub-Dominated

Shrub-dominated grassland: This state is characterized by soil surface degradation and truncation (Gile and Grossman 1997) and little grass cover. Shrubs may be very dense. In some cases, only small patches of tobosa, burrograss and/or threeawns may exist, and fluffgrass may be an important component of cover. Buffington and Herbel (1965) have documented a great deal of turnover in the composition of dominant shrubs within the Dona Ana-Reagan map unit of the Jornada Experimental Range. Generally, the trend has been a shift from tarbush to a

mix of creosotebush and mesquite. They speculate that this is due to the relatively greater motility of tarbush seeds compared to mesquite or creosotebush. Grass cover may vary depending upon the species of invading shrubs. Grass cover is reputed to be higher where tarbush has invaded in comparison to other shrubs, but this may simply represent the sequence of shrub invasion paralleling the effects of erosional soil degradation and grass loss, rather than any direct effect. In tarbush shrublands that currently receive little grazing pressure, microbiotic crusts may be very common. This may represent the first steps towards long-term recovery. Diagnosis: Density of shrubs, including mesquite, tarbush, and/or creosotebush ranges is high. The cover of perennial grasses including tobosa, burrograss, fluffgrass, and threeawns is low and restricted to small patches or scattered plants. Bare ground is dominant and interconnected or continuous. Soil truncation is apparent and pedestalling and other signs of erosion are ubiquitous. Either biotic or physical crusts, usually both, are common. Transition to burrograss-tobosa-threeawn grassland state (5). Shrub removal in combination with soil amendments, or pitting and seeding, may catalyze progress towards recovery of a grass component. If grass establishment fails, and increased production of shrubs and annuals may be observed. Such approaches have not met with success on loamy soils in SD-2, perhaps due to rainfall limitations after seeding. Where erosion has exposed saline or carbonate-rich soils, chemical treatments (or flushing) to reduce these compounds would also be required. Data and information sources and theoretical background: Some information is available from a number of Jornada Experimental Range long-term monitoring plots (known as the permanent quadrats) that occur on the Dona-Ana-Reagan map unit (Dona Ana County soil survey). These provide data on the dominants occurring in 1m2 plots from 1915/16 or 1926/27 to 2001. Unfortunately, there are clear discrepancies in the boundaries and composition of the soil map unit in the Dona Ana County soil survey and the vegetation maps documented in 1998 by Robert P. Gibbens (unpublished). The Desert Project soil survey overlaps part of the area mapped by Gibbens and this association is relied upon heavily in this presentation. The extension of the Desert Project mapping effort to the north will be invaluable. Information on dynamics is provided by Buffington and Herbel (1965). Other observations by Jim Powell, NRCS retired, and Brandon Bestelmeyer, USDA-ARS Jornada Experimental Range are reported. As described in detail in the Clayey site Overview: Data and information sources and theoretical background, the soil truncation hypothesis holds that erosion exposes a hardened argillic B horizon, or calcium carbonate-rich horizon, that resists infiltration and may inhibit establishment. Hypotheses regarding the limitations placed upon black grama and the invasion of mesquite are discussed in the Sandy overview section.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season**			110–164	
	black grama	BOER4	*Bouteloua eriopoda*	110–164	–
2	**Warm Season**			27–55	
	bush muhly	MUPO2	*Muhlenbergia porteri*	27–55	–
3	**Warm Season**			0–27	
	blue grama	BOGR2	*Bouteloua gracilis*	0–27	–
4	**Warm Season**			17–44	
	threeawn	ARIST	*Aristida*	17–44	–
	burrograss	SCBR2	*Scleropogon brevifolius*	17–44	–
5	**Warm Season**			6–27	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	6–27	–
	ring muhly	MUTO2	*Muhlenbergia torreyi*	6–27	–
6	**Warm Season**			27–55	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	27–55	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	27–55	–
7	**Warm Season**			55–82	
	tobosagrass	PLMU3	*Pleuraphis mutica*	55–82	–

8	**Warm Season**			27–55	
	alkali sacaton	SPAI	*Sporobolus airoides*	27–55	–
9	**Warm Season**			6–27	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	6–27	–
	Arizona cottontop	DICA8	*Digitaria californica*	6–27	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	6–27	–
10	**Warm Season**			6–17	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	6–17	–
Shrub/Vine					
11	**Shrub**			6–55	
	fourwing saltbush	ATCA2	*Atriplex canescens*	6–55	–
	longleaf jointfir	EPTR	*Ephedra trifurca*	6–55	–
	soaptree yucca	YUEL	*Yucca elata*	6–55	–
12	**Shrub**			6–17	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	6–17	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	6–17	–
Forb					
13	**Forb**			6–27	
	dwarf desertpeony	ACNA2	*Acourtia nana*	6–27	–
	desert marigold	BAMU	*Baileya multiradiata*	6–27	–
	croton	CROTO	*Croton*	6–27	–
	redstem stork's bill	ERCI6	*Erodium cicutarium*	6–27	–
	buckwheat	ERIOG	*Eriogonum*	6–27	–
	globemallow	SPHAE	*Sphaeralcea*	6–27	–
14	**Forb**			6–17	
	southern goldenbush	ISPL	*Isocoma pluriflora*	6–17	–
	Texan phacelia	PHINT	*Phacelia integrifolia var. texana*	6–17	–
	woolly plantain	PLPA2	*Plantago patagonica*	6–17	–
15	**Forb**			6–17	
	milkvetch	ASTRA	*Astragalus*	6–17	–
	Russian thistle	SAKA	*Salsola kali*	6–17	–
	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	6–17	–
16	**Annual/Perennial Forbs**			6–27	
	Forb, annual	2FA	*Forb, annual*	6–27	–
	Forb, perennial	2FP	*Forb, perennial*	6–27	–

Animal community

This site provides habitat which support a resident animal community that is characterized by pronghorn antelope, coyote, black-tailed jackrabbit, spotted ground squirrel, bannertail kangaroo rat, desert pocket mouse, marsh hawk, horned lark, meadow lark, scaled quail, western box turtle, New Mexico whiptail lizard and western spadefoot toad.

Where large yucca, cholla and mesquite are present, this site is a breeding area for mockingbird, Scott’s oriole and mourning dove.

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
Berino B
Reakor B
Dona Ana B
Bucklebar B
Gila B
Mohave B
Tres Hermanos B
Harkey B
Stellar C
Mimbres B
Mcnew B
Tome B
Stellar C

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 occasional 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 forage is produced in the summer months. The site is best adapted for cattle, sheep, and horses. Retrogression caused by inadequate grazing management is characterized by an increase in such plants as burrograss, threeeawns, tobosa, fluffgrass, and broom snakeweed. The site is definitely subject to invasion by mesquite, and once this has occurred, it does not recover rapidly through grazing management alone.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index Ac/AUM
100 - 76 3.6 – 4.5
75 – 51 4.3 – 6.0
50 – 26 5.7 – 12.0
25 – 0 12.0 - +

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:
Berino sandy clay loam, very fine sandy loam
Bucklebar loam, very fine sandy loam
Reakor silt loam
Mohave loam, very fine sandy loam, silty clay loam, silty loam
Dona Ana sandy clay loam, very fine sandy loam
Other Soils included are:
Hoban silty clay loam
Turney sandy clay loam
Russler silt loam
Continental sandy clay loam
Stellar sandy clay loam
Mohave sandy clay loam

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:

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17. **Perennial plant reproductive capability:**
