USDA Natural Resources Conservation Service

Ecological site R070BC008NM
Draw

Accessed: 05/05/2024

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

R070BC017NM	**Bottomland** Bottomland

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs as desert drainageways, stream terrace, flood plain or draws which disect plains or hills. This site receives and transports runoff water from both remote higher elevations and adjacent sites to closed basins or larger water courses. Slopes range from 0 to 3 percent, averages about 1 percent. Elevation range from 3,300 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Drainageway (2) Draw (3) Flood plain
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,006–1,372 m
Slope	0–3%
Aspect	E, S, W

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity - short duration thunderstorms.

Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero tin the winter to 112 degrees in the summer.

The average frost-free season is 207 to 220 days. The last killing frost is in late March or early April, and the first killing frost is in late October or early November.

Both temperatures and precipitation favor warm season perennial growth. However, this site is cooler and more moist than adjacent sites due to the cold air drainage, a higher rate of evapotranspiration and the increased moisture opportunity from adjacent area runoff results in a greater potential for trees, shrubs and cool season grasses.

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.

Table 3. Representative climatic features

Frost-free period (average)	221 days
Freeze-free period (average)	240 days
Precipitation total (average)	330 mm

Influencing water features

Soil features

Soils are deep or very deep, and may be. occasionally flooded. Surface textures are clay loam, silty clay loam, silty clay or clay. Substratum textures are silty clay loam, silty clay or clay and may be stratified with very fine sand or fine loamy sands. The profile may have gravelly or cobbly textures in some areas. Calcium sulfate and other salts in the form of films, masses, threads and crystals range from few to many.

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

Characteristic Soils:
Pecos

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	104–183 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0–1%
Available water capacity (0-101.6cm)	17.78–30.48 cm
Calcium carbonate equivalent (0-101.6cm)	2–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm

Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

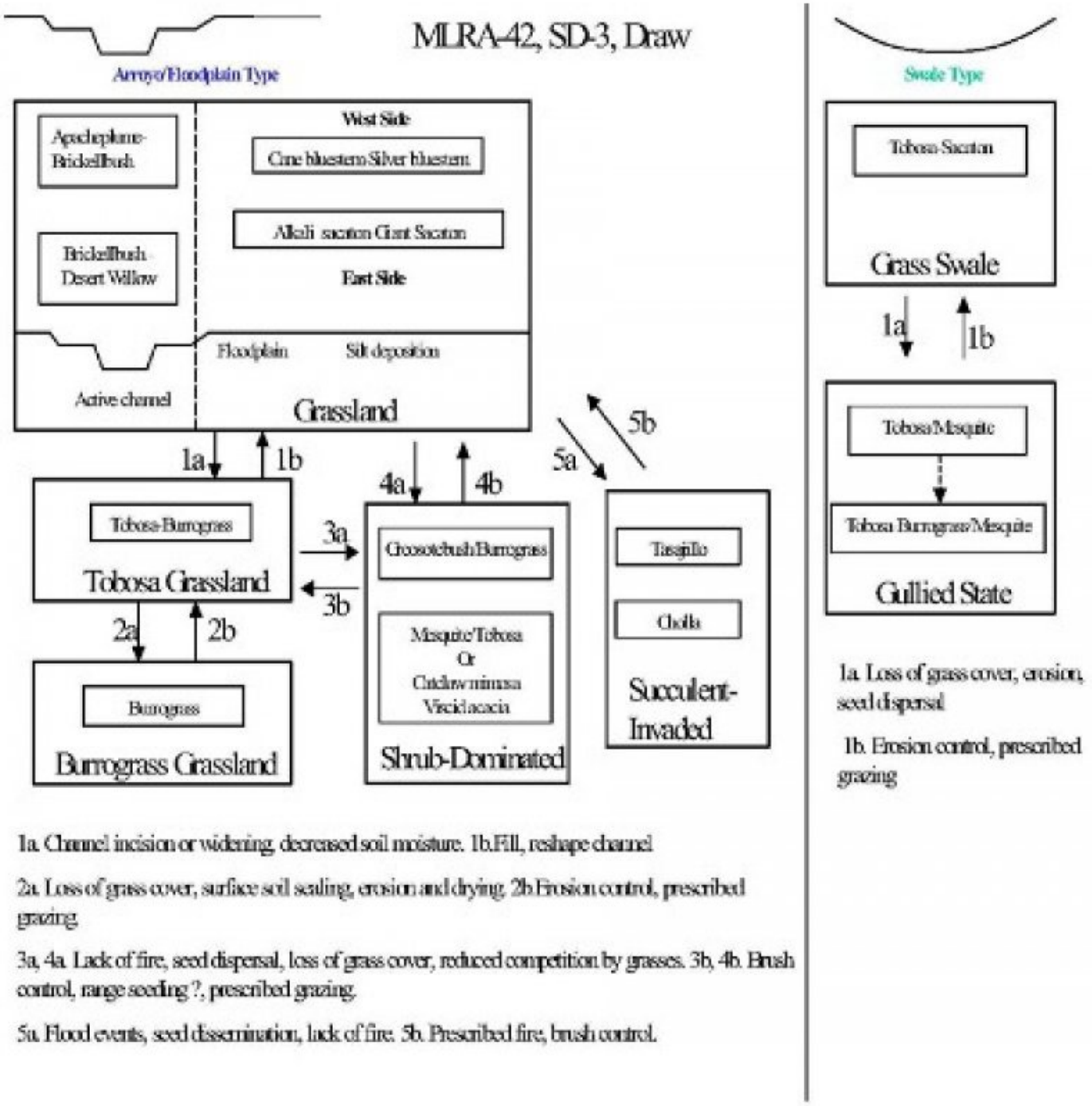
Overview

The Draw site occurs in two distinct forms, The Arroyo/Floodplain, and the Swale. The arroyo form has a channel, typically loams or gravelly/cobbly loams and an associated floodplain with loam, silt loam, or clay loam soils. It occurs as desert drainageways that dissects hills and transports run-off water from remote higher elevations and adjacent sites to larger watercourses or closed basins. Woody vegetation, such as mesquite, Apache plume, brickellbush, and desert willow dominate the edge of the arroyo, with alkali sacaton and giant sacaton dominating the adjacent floodplain.
The swale form occurs in slightly concave positions dissecting low hills and uplands from which it receives and transports run-in water to bottomlands. Soils are loams, silt loams, and clay loams. Grasses such as tobosa, giant sacaton, and alkali sacaton typically dominate this form, with a few woody species scattered across the site.

Information on landscape positions and vegetation dynamics stated in this model are in part taken from personal communications recorded at (SD-3) State & Transition model meeting, Carlsbad, NM. 2003.

State and transition model

Plant Communities and Transitional Pathways (diagram)



State 1
Historic Climax Plant Community 1

Community 1.1
Historic Climax Plant Community 1

The Arroyo/Floodplain type consists of two separate elements, the arroyo channel and its associated floodplain. This site is an ephemeral stream floodplain with a gently sloping surface, broad enough that the channel covers

only a part of the surface. Vegetation on the site varies dynamically with parent material, distance away from the channel, and amount of gravel and cobble in the soil profile. Trees and shrubs are typically dominant along the channel border, but grasses dominate the floodplain. A wide variety of woody species can occur on this site including, Apache plume, brickellbush, desert willow, mesquite, catclaw mimosa, viscid acacia, and New Mexico walnut. Dominant grass species tend to vary somewhat moving East to West across the resource unit. Cane bluestem and silver bluestem are typical dominants on the western side of the resource unit. Alkali sacaton and giant sacaton tend to dominate more on the eastern side. Other important grasses common to both areas include vine mesquite, sideoats grama, tobosa, Arizona cottontop, and twoflower trichloris. Total annual production on this site is high averaging up to 3500 pounds per acre during years with favorable rainfall. Overgrazing may cause an increase in tobosa, and a decrease in vine mesquite, sideoats grams, Arizona cottontop, and twoflower trichloris. Diagnosis: Trees and shrubs tend to dominate along the channel border, with patches of grass supported by silt accumulation around cobbles, stones, shrubs and trees. Across the floodplain, bluestems, or alkali sacaton and giant sacaton are typically the dominant grasses. Grass and litter cover is high. Trees and shrubs are infrequent and scattered. Bare patches are small, typically less than 1-2 meters across

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	968	1896	2825
Shrub/Vine	269	527	785
Forb	108	211	314
Total	**1345**	**2634**	**3924**

Figure 5. Plant community growth curve (percent production by month). NM2808, R042XC008NM Draw HCPC. R042XC008NM Draw HCPC .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	3	8	7	18	28	25	6	2	0

State 2
Tobosa Grassland

Community 2.1
Tobosa Grassland

Additional States: Tobosa Grassland: This state is characterized by decreased available soil moisture and the dominance of tobosa. Burrograss is typically a component of this state and depending on the degree of soil moisture loss, may become sub-dominant to tobosa. Diagnosis: Grass cover is variable ranging from uniform and continuous to patchy, with increased bare areas. Tobosa is the dominant grass. Tall grasses such as giant sacaton, and bluestems may occur in small patches occupying small, moister micro-sites, or are absent. Burrograss is found at increased densities relative to the HCPC. Shrubs are infrequent and scattered. Transition to the Tobosa Grassland (1a): Decreased available soil moisture due to deepening of the channel may cause the loss of more mesic grasses such as bluestems, giant sacaton, and alkali sacaton, resulting in a tobosa-dominated grassland. Key indicators of approach to transition: Indicators prior to this transition are few and not readily observable. By the time changes in the channel width or steepness or height of channel banks is observable the transition has already begun. Decreases in overall grass heights throughout the water shed. Increases in sediment loading. Transition back to HCPC Grassland (1b) The natural hydrology of the site must be restored to enable the transition back to the HCPC Grassland. Filling or reshaping of the channel may help to restore natural overland flow patterns on to the floodplain, providing the additional run-on water necessary for the establishment and survival of the more mesic grass species.

State 3
Burrograss Grassland

Community 3.1

Burrograss Grassland

Burrograss Grassland: This state is characterized by the dominance of burrograss and increased soil surface sealing. Burrograss favors calcareous fine textured soils and spreads by seed and stolons. It produces large amounts of seed with wiry awns that help in dissemination, and in auguring the hardened callus (tip of the seed) into the soil. The ability of burrograss to auger into soils enables it to establish and expand on bare soils prone to crust over with physical and biological crusts. Diagnosis: Grass cover is patchy with large bare areas present. Burrograss is the dominant grass species. Tobosa may be present in scattered patches. Soil surface sealing is evident on most of the exposed bare ground. Erosion is apparent by the presence of water flow patterns, rills, litter dams, and pedestalling of plants. Transition to the Burrograss Grassland (2a) Loss of deep-rooted grasses and overall grass cover due to overgrazing or extended periods of drought may initiate this transition. As grass cover declines, resistance to water flow decreases and erosion increases, causing surface soils to seal. As surface soils seal, infiltration and permeability decrease. This transition may be soil determined. 3 Key indicators of approach to transition: Decrease in cover of tobosa. Increased amount of bare ground. Increased evidence of physical and biological crusts. Transition back to Tobosa Grassland (2b) Erosion control structures or shaping and filling gullies may help regain natural flow patterns and establish vegetation if the flow has been channeled. Prescribed grazing will help establish proper forage utilization and maintain grass cover and litter necessary to protect the site from accelerated erosion.

State 4
Shrub-Dominated

Community 4.1
Shrub-Dominated

Shrub Dominated: Increased cover of shrubs characterizes this state. Mesquite, catclaw mimosa, viscid acacia or creosotebush are typically the dominant shrub species. Grass cover is typically patchy with large bare areas present, however in some instances grass cover may remain relatively high for extended periods when associated with light to moderate infestations of mesquite, catclaw mimosa, or viscid acacia. Variations in soil characteristics may determine which shrub species increase. Mesquite is well adapted to a wide range of soil types, but increases more often on draw sites that exhibit fine textured, deep soils low in carbonates. Catclaw mimosa and viscid acacia prefer gravelly soils and tend to form thickets along the edges of the channel. Creosotebush is less tolerant of fine textured soils, perhaps due to its high oxygen demand, and tends to occur more often on limestone derived calcareous soils that have some rock fragments in the soil profile. Diagnosis: Mesquite, catclaw mimosa, viscid acacia, or creosotebush are the dominant shrubs. Cover of bluestems, alkali sacaton, and giant sacaton is low or absent. Tobosa or burrograss are the dominant grasses. Typically grass cover is patchy with large interconnected bare areas present. Physical soil crusts are present, especially on silt loam surface soils. Transition to Shrub-Dominated (3a, 4a) Reduction of fire, due to either fire suppression policy or loss of adequate fine fuels may increase the probability of shrub encroachment.6 Flood events, livestock and wildlife can transport and disperse shrub seed. Persistent loss of grass cover due to overgrazing or drought can cause large bare patches, providing competition free areas for shrub seedling establishment. As shrub cover increases, competition for soil resources, especially water, becomes a major factor in further reducing grass cover. Key indicators of approach to transition: Decreased grass and litter cover. Increased bare patch size. Increase in amount of shrub seedlings. Transition back Grassland (3b, 4b) Brush control will be necessary to remove shrubs and eliminate competition for resources necessary for grass establishment or reproduction. Range seeding may be necessary if inadequate desired grass species remain in the system. Prescribed grazing will help ensure adequate time is elapsed before grazing is allowed, and proper forage utilization following grass establishment.

State 5
Succulent-Invaded

Community 5.1
Succulent-Invaded

Succulent-Invaded: Succulents, especially tasajillo and cholla may invade the Draw site. Dense stands of tasajillo or cholla are recognized as a management concern, but their impact on grass production is unclear. Light to medium infestations of these succulents does not seem to greatly reduce grass production, however they can reduce access to available forage and interfere with livestock movement and handling. Diagnosis: Cholla and/or tasajillo are

present. Grass cover is variable, typically relatively uniform with light infestations of succulents, and becoming patchier with increased amounts of bare ground as succulent densities increase. Tobosa is the dominant grass if from transition 3a. Bluestems or alkali sacaton and giant sacaton are the dominant grasses, if from transition 4a. Transition to Succulent-Invaded (3a, 4a) Succulents may invade and increase on Draw sites due to dispersal of seed and stem parts by flood events, livestock and wildlife. If fire was historically a part of desert grassland ecosystem and played a role in suppressing seedlings of shrubs and succulents, then fire suppression may favor the increase of succulents.1 Key indicators of approach to transition: Decrease or change in distribution of grass cover. Presence of succulents on site. Transition back to Grassland (3b, 4b) Fire is an effective means of controlling cholla and tasajillo if adequate grass cover remains to carry fire.2 Chemical control is effective in controlling cholla and tasajillo; apply when growth starts in May. For light infestations, hand grubbing is also effective if cholla or tasajillo is severed 2-4 inches below ground and care is taken not to let broken joints take root. Stacking and burning piles and grubbing during winter or drought help keeps broken joints and pads from rooting.

State 6
Historic Climax Plant Community 2

Community 6.1
Historic Climax Plant Community 2

1.State Containing Historic Plant Community Swale Type Grass Swale: The historic plant community has a grassland aspect with a few shrubs scattered across the site. This site is associated with the Bottomland ecological site. It occurs as narrow to broad areas, with a sinuous linear slightly concave shape, dissecting adjacent upland, and transporting run-in water to lower Bottomland sites. The draw site stands out in relation to the adjacent uplands, due to the extra water and high production. Tobosa is the dominant grass species, with alkali sacaton and giant sacaton as sub-dominants. Other important species include vine mesquite, blue grama, cane bluestem, and sideoats grama. Mesquite, catclaw mimosa, and fourwing saltbush are common shrubs. This site is resistant to state change unless grass cover on site or surrounding uplands is reduced to the point that accelerated erosion takes place. Severe loss of grass cover due to extended periods of drought or overgrazing may initiate the transition to a gullied state and an increase in shrubs. Diagnosis: Tobosa is the dominant grass species. Grass cover is continuous and uniform. Bare ground is minimal. Shrubs are sparse and evenly distributed. Slopes are nearly level; usually less than three percent, and usually display limited evidence of active rill or gully formation if grass cover remains intact. Litter movement associated with overland flow is limited to smaller size class litter and short distances.

Figure 6. Plant community growth curve (percent production by month). NM2808, R042XC008NM Draw HCPC. R042XC008NM Draw HCPC .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	3	8	7	18	28	25	6	2	0

State 7
Gullied State

Community 7.1
Gullied State

Additional States: Gullied State: Loss of grass cover, accelerated erosion, and gully formation characterize this state. Tobosa is the dominant grass species. Vine mesquite, blue grama, cane bluestem, sideoats grama, giant sacaton and alkali sacaton decrease or are extirpated. Burrograss increases and may become sub-dominant to tobosa. Shrub densities may increase especially mesquite, facilitated by increased bare patches. Diagnosis: Tobosa is dominant. Burrograss may be the sub-dominant grass species. Mesquite and other shrubs may be found at increased densities relative to the historic plant community. Grass cover is no longer uniformly distributed, instead tending to be patchy with large areas of bare ground present. Erosion is evident by the presence of water flow patterns, litter dams, rills, and gullies. Transition to the Gullied State (1a): Transitions to the gullied state may occur in response to a loss of grass cover (on or off site), erosion, and changes in hydrology. As grass cover decreases, organic matter and surface soil stability decrease.4, 5 Erosion ensues due to increased flow rates and decreased soil stability. The formation of gullies effectively changes the hydrology, and the site dries. Bare patch

size increases providing competition free areas for shrub expansion. Key indicators of approach to transition: Reduction in grass cover (on site, or on surrounding uplands) and increase in size and frequency of bare patches. Evidence of litter movement—indicating loss or redistribution of organic matter, and decreased surface soil stability. Presence of litter dams, water flow patterns, rills and gullies. Transition back to Grass Swale (1b) Erosion control structures or shaping and filling gullies may help regain natural flow patterns and allow natural revegetation to take place. Prescribed grazing will help ensure proper forage utilization and reduce grass loss due to grazing.

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**			263–395	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	263–395	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	263–395	–
2	**Warm Season**			263–395	
	Arizona cottontop	DICA8	*Digitaria californica*	263–395	–
3	**Warm Season**			80–132	
	alkali sacaton	SPAI	*Sporobolus airoides*	80–132	–
4	**Warm Season**			263–395	
	sideoats grama	BOCU	*Bouteloua curtipendula*	263–395	–
	vine mesquite	PAOB	*Panicum obtusum*	263–395	–
5	**Warm Season**			132–263	
	blue grama	BOGR2	*Bouteloua gracilis*	132–263	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	132–263	–
6	**Warm Season**			80–132	
	hooded windmill grass	CHCU2	*Chloris cucullata*	80–132	–
7	**Warm Season**			80–132	
	bush muhly	MUPO2	*Muhlenbergia porteri*	80–132	–
8	**Warm Season**			132–263	
	green sprangletop	LEDU	*Leptochloa dubia*	132–263	–
9	**Other Perennial Grasses**			0–132	
	Grass, perennial	2GP	*Grass, perennial*	0–132	–
Shrub/Vine					
10	**Shrub/Tree**			263–396	
	viscid acacia	ACNE4	*Acacia neovernicosa*	263–396	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	263–396	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	263–396	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	263–396	–
	screwbean mesquite	PRPU	*Prosopis pubescens*	263–396	–
11	**Shrub**			80–132	
	knifeleaf condalia	COSP3	*Condalia spathulata*	80–132	–
	Apache plume	FAPA	*Fallugia paradoxa*	80–132	–
12	**Tree/Vine**			132–211	
	desert willow	CHLI2	*Chilopsis linearis*	132–211	–

	western white clematis	CLLI2	*Clematis ligusticifolia*	132–211	–
	Arizona walnut	JUMA	*Juglans major*	132–211	–
13	**Other Shrubs**			0–132	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–132	–
Forb					
14	**Forb**			0–80	
	Indian blanket	GAPU	*Gaillardia pulchella*	0–80	–
	globemallow	SPHAE	*Sphaeralcea*	0–80	–
15	**Forb**			0–80	
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	0–80	–
	coyote tobacco	NIAT	*Nicotiana attenuata*	0–80	–
16	**Forb**			132–211	
	stork's bill	ERODI	*Erodium*	132–211	–
	common sunflower	HEAN3	*Helianthus annuus*	132–211	–
17	**Other Forbs**			0–80	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–80	–

Animal community

This site provides habitats which support a resident animal community that is characterized by pronghorn antelope, black-tailed jackrabbit, black tailed prairie dog, yellow-faced pocket gopher, banner-tailed kangaroo rat, hispid cotton rat, swift fox, burrowing owl, horned lark, mockingbird, meadowlark, mourning dove, scaled quail, Great Plains toad, plains spadefoot toad, collard lizard, western diamondback rattlesnake,and western coachwhip snake.

Hydrological functions

Runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups

Soils Hydrologic Group
Pecos D

Recreational uses

This site offers recreation potential for hiking, horseback riding, picnicking, camping, outdoor classrooms, nature observation, photography, upland gamebird hunting and trapping for fur bearing animals. Colorful wildflowers bloom in spring. Because of extra water received, this site has an “oasis” aspect.

Wood products

This site has a fairly abundant supply of driftwood. Wood is also available from willow, walnut and mesquite for use as curiosities and furniture, and for fence material and fuelwood.

Other products

This site is suitable for grazing by all kinds and classes of livestock during all seasons of the year. It is especially suited for winter and early spring grazing, due to the high protein levels in the forage. Under retrogression, reproduction of many of the tree species will stop and species like Arizona cottontop, vine-mesquite, sideoats grama, and plains bristlegrass will decrease. An increase in mesquite, catclaw mimosa and viscid acacia will follow. This site responds well to a system of grazing that utilizes the protein source and allows for alternate rest.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM
100 - 76 2.0 – 3.7
75 – 51 3.0 – 5.0
50 – 26 4.8 – 6.8
25 – 0 6.9 +

Inventory data 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 Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Lea, Chavez, and Eddy Counties.

Other references

Literature References:
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2. Bunting, S.C., H.A. Wright, and L.F. Neuenschwander. 1980. Long-term effects of fire on cactus in the Southern Mixed Prairie of Texas. J. Range. Manage. 33: 85-88.

3. Gibbens, R.P. and R.F. Beck. 1987. Increase in number of dominant plants and dominance-classes on a grassland in the northern Chihuahuan Desert. Journal of Range Management 40:136-139.

4. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Aggregate Stability. Rangeland Sheet 3, [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

5. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Organic Matter. Rangeland Sheet 6, [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

6. Wright, H.A., and A.W. Bailey. 1982. Fire ecology: United States and southern Canada. New York: John Wiley and Sons. 501p.

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:

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

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

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

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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:**
