USDA Natural Resources
Conservation Service

Ecological site R077BY034NM
Deep Loamy Plains

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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.

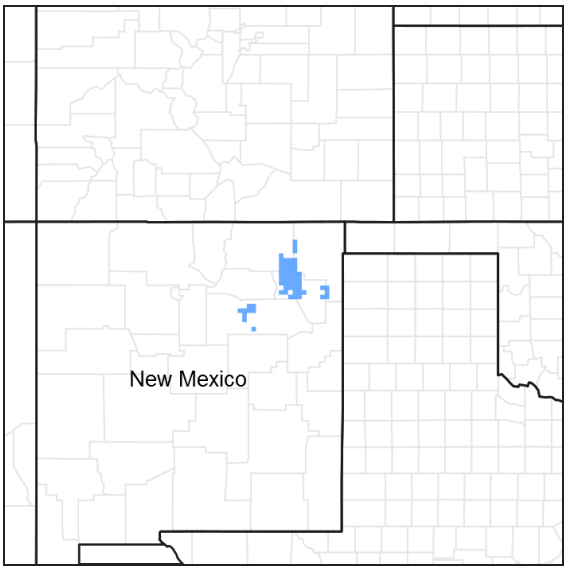

Figure 1. Mapped extent

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.

Classification relationships

Other References:
Data collection for this site was done in conjunction with the progressive soil surveys within the Southern High Plains 77 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Union, Harding Colfax.
Characteristic Soils Are:
Dallam Vingo
Rickmore
Other Soils included are:
Church, Dalhart, Manter, Otero, Spurlock Seelize

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level to undulating areas of the High Plains. Characteristically, the landscape is

hummocky. Elevation ranges from 4,300 feet to 6,200 feet above sea level.
Slopes are usually from 0 to 8 percent. The exposure varies and is not significant.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Sand sheet
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Elevation	1,311–1,890 m
Slope	0–8%
Water table depth	137–183 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area can be classified as “semi-arid continental”.

Precipitation averages from about 15 to 16 inches annually with approximately 75 percent of this yearly moisture falling during the period of May through October. Most summer rainfall is associated with usually brief afternoon and evening thundershowers, which occasionally produce heavy rain over a small area, and sometimes bring a little hail. Winters are generally dry, with only one or two days a month when as much as one-tenth inch of moisture falls. However, winter average 20 inches of snow, although most snowfalls are light with an occasional storm producing up to six inches. Following these storms, snow may lie on the ground for several days and occasionally moderate to strong winds accompanying these storms result in blizzard conditions and heavy drifting. Although the precipitation patterns favor the production of warm-season plants, sufficient moisture is received in the late winter and the spring to support cool-season plants. Approximately 25 percent of the annual precipitation is received during April and May. May is generally the wettest month followed by July and then August.

Temperatures show the seasonal changes and large annual and diurnal ranges characteristic of such a climate. Summers are generally mild. The high daily temperature reading exceed 90 degrees F about one-third of the time, and readings of 100 degrees F occur about once a year. Rapid cooling after sundown results in minimum temperatures below 60 degrees F on most nights, even in midsummer. Winter shade temperatures usually rise to the mid-40’s and an average of only 15 days fail to see temperatures rise above the freezing mark most of the time from early November through March; below zero readings occur on an average of only three times a year.

The freeze-free season ranges from 168 days to 171 days between April 28th to October 16th. Both temperatures and annual precipitation favor warm-season plants. About 40 percent of the annual precipitation is received during the season where temperatures will benefit cool-season plants and only 10 percent falls during the dormant season.

While open to winter invasions of arctic air over the Great Plains, this area is far enough south and west to miss many of these outbreaks. Mountains to the north and west intercept mush of the precipitation from the Pacific northwest storms coming through this area during the winter. An average hourly wind velocity for the year is 15 miles per hour. Somewhat higher winds prevail during the spring months, but velocities exceeding 24 mile per hour are experienced only 10 percent of the usual year. Stronger winds blow chiefly from a westerly or southwesterly direction during the spring. Relative humidity is moderately low.

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)	191 days
Freeze-free period (average)	220 days
Precipitation total (average)	406 mm

Influencing water features

This site is not influenced by water from a wetland or stream.

Soil features

The soils of this site are deep, and well drained. The surface textures are fine sand or loamy fine sand from 8 to 20 inches thick. The texture of the argillic subsoil is sandy clay loam or fine sandy loam. In some soils, a calcic horizon occurs at a depth of 12 to 20 inches. The soils have a moderately rapid to moderate permeability. The available water-holding capacity is moderate to high. The plant-soil-air-water relationship is good. Effective rooting depth is 60 inches or
more. These soils are particularly susceptible to wind erosion when vegetative cover is reduced.

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Loamy sand (3) Clay loam
Family particle size	(1) Sandy
Drainage class	Somewhat poorly drained to somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	152–183 cm
Available water capacity (0-101.6cm)	15.24–30.48 cm
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	0–27%
Subsurface fragment volume >3" (Depth not specified)	0–2%

Ecological dynamics

State and transition model

Ecosystem states

1. Historic Climax Plant Community

State 1 submodel, plant communities

1.1. Historic Climax Plant Community

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

This site is a grassland dominated by warm-season mid-grasses. Tall grasses, cool-season grasses and forbs make up an important component of the plant community. Woody plants make up a minor component Other grasses that could appear on this site include: red lovegrass, sand muhly, threeawn spp., tumble lovegrass, paspalum, dryland sedge, hooded windmill grass, and silver bluestem. Other shrubs include: threadleaf groundsel and broom snakeweed. Other forbs include: silky prairie clover, scrufpea, western ragweed, gilia, silverleaf nightshade, prickly poppy, and bladderpod.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1227	1760	2291
Shrub/Vine	185	266	345
Forb	135	193	273
Total	**1547**	**2219**	**2909**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	10-15%
Grass/grasslike foliar cover	30-35%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-25%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Figure 5. Plant community growth curve (percent production by month). NM4734, R077BY034NM Shallow Sandy Plains Reference State. R077BY034NM Shallow Sandy Plains Reference State.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	3	3	5	5	25	30	15	8	4	0

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	**Sand Bluestem**			362–482	
	sand bluestem	ANHA	*Andropogon hallii*	362–482	–
2	**Little Bluestem**			362–482	
	little bluestem	SCSC	*Schizachyrium scoparium*	362–482	–
3	**NM Feathergrass Needleandthread**			362–482	
	needle and thread	HECO26	*Hesperostipa comata*	362–482	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	362–482	–
4	**Sideoats grama**			241–362	
	sideoats grama	BOCU	*Bouteloua curtipendula*	241–362	–
5	**Blue Hairy Grama**			121–241	
	blue grama	BOGR2	*Bouteloua gracilis*	121–241	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	121–241	–
6	**Indiangrass Switchgrass**			121–241	
	switchgrass	PAVI2	*Panicum virgatum*	121–241	–
	Indiangrass	SONU2	*Sorghastrum nutans*	121–241	–
7	**Indian ricegrass**			121–241	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	121–241	–
8	**giant spike sand dropseeds**			73–121	
	spike dropseed	SPCO4	*Sporobolus contractus*	73–121	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	73–121	–
	giant dropseed	SPGI	*Sporobolus giganteus*	73–121	–
9	**other grasses**			73–121	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	73–121	–
Forb					
10	**Buckwheat sunflower globemallow stickleaf**			73–121	
	buckwheat	ERIOG	*Eriogonum*	73–121	–
	sunflower	HELIA3	*Helianthus*	73–121	–
	Adonis blazingstar	MEMU3	*Mentzelia multiflora*	73–121	–
	globemallow	SPHAE	*Sphaeralcea*	73–121	–
11	**Other forbs**			73–121	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	73–121	–
Shrub/Vine					
12	**Sand sagebrush**			121–241	
	sand sagebrush	ARFI2	*Artemisia filifolia*	121–241	–
13	**yucca skunkbush sumac**			73–362	
	skunkbush sumac	RHTR	*Rhus trilobata*	73–362	–
	yucca	YUCCA	*Yucca*	73–362	–
14	**Other shrubs**			73–121	
	Shrub, deciduous	2SD	*Shrub, deciduous*	73–121	–

Animal community

No Data.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.
Soil Series--- Hydrologic Group
Church-------- D
Dalhart------- B
Dallam-------- B
Manter-------- B
Otero--------- B
Rickmore------ C
Spurlock------ B
Vingo--------- B

Recreational uses

Recreation potential is limited due to the lack of access roads for two-wheel drive vehicles, lack of live water and lack of shade. The terrain typical of the “wide open spaces” of the area enhances aesthetic appeal. Hunting for upland game birds and antelope is fair. The natural beauty is enhanced by the variety of flowering plants that bloom from early spring to fall and varying color hues of vegetation as it matures.

Wood products

This site has no significant wood production potential.

Other products

Grazing:
This site can be grazed any season of the year by all classes of livestock, generally without regard to age. However, it is most efficiently utilized by cattle. The variety of grasses, forbs and half-shrubs furnishes good nutrition to grazing animals during most seasons of the year.
Approximately 90 percent of the annual production furnishes forage for grazing animals.
Continuous grazing or grazing continually during the period from April through October by cattle will result in a plant community dominated by low forage value species such as sand dropseed, sand sagebrush, yucca and threeawn spp. Sand sagebrush and yucca may increase to the extent that they become the dominant vegetation. A system of deferred grazing, which varies the season of grazing and rest is needed to maintain or improve a healthy well-balanced plant community. Rest in different seasons benefits different plants. Winter rest will benefit all woody species. Spring rest (April-June) encourages forb production and will benefit New Mexico feathergrass and needleandthread. Summer rest (July-September) benefits warm-season grasses such as sand bluestem, sideoats grama, and little bluestem to grow and reproduce. Fall rest allows plants to complete their growth cycle. New Mexico feathergrass and needleandthread is utilized readily by cattle in the spring and fall and least utilized in the summer when the awns interfere with utilization and may injure cattle. Although utilization in June is detrimental to stands of needleandthread and New Mexico feathergrass, a quick, moderate cropping when the heads are in the boot stage of development, can remove the heads and prevent subsequent interference and injury to cattle by the awns. For this purpose, the timing and degree of use must be determined on limited areas, preferably when soil moisture is adequate for regrowth, and should be followed by a period of deferment.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index---- Ac/AUM
100 - 76---------- 1.8 – 3.0

75 – 51---------- 2.3 – 4.3
50 – 26---------- 3.0 – 8.6
25 – 0---------- 8.6+

Inventory data references

Other References:
Data collection for this site was done in conjunction with the progressive soil surveys within the Southern High Plains 77 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Union, Harding Colfax.
Characteristic Soils Are:
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Rickmore
Other Soils included are:
Church, Dalhart, Manter, Otero, Spurlock Seelize

Type locality

Location 1: Colfax County, NM
Location 2: Harding County, NM
Location 3: Union County, NM

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:**

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

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

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

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

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

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

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

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

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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):**

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:**