

## Ecological site R038XB101NM Shallow

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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.

Table 1. Dominant plant species

|            |               |
|------------|---------------|
| Tree       | Not specified |
| Shrub      | Not specified |
| Herbaceous | Not specified |

### Physiographic features

This site occurs on nearly level to moderately sloping uplands. Slopes average less than 15 percent. Elevation range from about 5,000 to 6,800 feet above sea level.

Table 2. Representative physiographic features

|           |                                    |
|-----------|------------------------------------|
| Landforms | (1) Plain                          |
| Elevation | 1,520 – 2,070 m                    |
| Slope     | 0 – 20 %                           |
| Aspect    | Aspect is not a significant factor |

### Climatic features

Average annual precipitation varies from about 12 inches to just over 16 inches. Substantial fluctuations from year to year are common, ranging from a low of about 6 inches to a high of over 30 inches. Approximately one-half of the annual precipitation comes in the form of rainfall during the months of July, August, and September, although wintertime precipitation in the form of snow, sleet, or rain is sometimes significant. Spring and late fall months are normally dry.

The average frost-free period ranges from about 165 to 190 days and extends from approximately the third or fourth week in April to mid October. Average annual air temperatures are about 56 degrees F. Summer maximums can exceed 100 degrees F and winter minimums on occasion go below zero. Monthly mean temperatures generally exceed 70 degrees F for the period of June through August.

Growing conditions favor warm-season perennial vegetation, although late winter and late summer precipitation is adequate to foster a significant cool-season component in the potential plant community. Occasional wet springs also create good conditions for annual forb production, but frequent winds from the west and southwest are common during this time of year and tend to deplete soil moisture at a critical time for the growth of these plants.

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)   | 190 days |
| Freeze-free period (average)  | 210 days |
| Precipitation total (average) | 410 mm   |

### Influencing water features

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

### Soil features

These shallow soils have calcareous gravelly and/or cobbly loams over cemented caliche hardpan within 20 inches. This layer is inhibiting to both roots and moisture penetration and creates a situation favorable to the more shallow rooted plants.

**Table 4. Representative soil features**

|                                         |                                                                           |
|-----------------------------------------|---------------------------------------------------------------------------|
| Surface texture                         | (1) Gravelly loam<br>(2) Cobbly clay loam<br>(3) Channery fine sandy loam |
| Family particle size                    | (1) Clayey                                                                |
| Drainage class                          | Well drained                                                              |
| Permeability class                      | Moderately slow                                                           |
| Soil depth                              | 10 – 50 cm                                                                |
| Surface fragment cover ≤3"              | 20 – 60 %                                                                 |
| Surface fragment cover >3"              | 20 – 60 %                                                                 |
| Available water capacity<br>(0-101.6cm) | 2.54 – 5.08 cm                                                            |

|                                                          |                 |
|----------------------------------------------------------|-----------------|
| Electrical conductivity<br>(0-101.6cm)                   | 0 – 10 mmhos/cm |
| Soil reaction (1:1 water)<br>(0-101.6cm)                 | 6.6 – 8.4       |
| Subsurface fragment volume <=3"<br>(Depth not specified) | 20 – 30 %       |
| Subsurface fragment volume >3"<br>(Depth not specified)  | 20 – 30 %       |

## Ecological dynamics

The site is adapted for cattle, sheep, and horses, generally without regard to class of livestock, although it has a tendency to become a winterfat range under strictly horse grazing and more of a grass and forb range under cattle grazing. Serious retrogression as a result of inadequately managed cattle grazing will be characterized by an increase in such plants as ring muhly, fluffgrass, broom snakeweed, and annuals, and in may cases by invading woody plants such as mesquite. Total production decreases substantially, bare ground increases, and intensive-grazing management is needed in order to effect a recovery.

## State and transition model

## Additional community tables

Table 5. Community 1.1 plant community composition

| Group                  | Common Name             | Symbol | Scientific Name                 | Annual Production () | Foliar Cover (%) |
|------------------------|-------------------------|--------|---------------------------------|----------------------|------------------|
| <b>Grass/Grasslike</b> |                         |        |                                 |                      |                  |
| 1                      |                         |        |                                 | 235-328              |                  |
|                        | black grama             | BOER4  | <i>Bouteloua eriopoda</i>       | 235-328              | –                |
| 2                      |                         |        |                                 | 94-141               |                  |
|                        | sideoats grama          | BOCU   | <i>Bouteloua curtipendula</i>   | 94-141               | –                |
| 3                      |                         |        |                                 | 47-94                |                  |
|                        | squirreltail            | ELEL5  | <i>Elymus elymoides</i>         | 47-94                | –                |
|                        | New Mexico feathergrass | HENE5  | <i>Hesperostipa neomexicana</i> | 47-94                | –                |
| 4                      |                         |        |                                 | 47-94                |                  |
|                        | blue grama              | BOGR2  | <i>Bouteloua gracilis</i>       | 47-94                | –                |
|                        | hairy grama             | BOHI2  | <i>Bouteloua hirsuta</i>        | 47-94                | –                |
| 5                      |                         |        |                                 | 0-28                 |                  |
|                        | tobosagrass             | PLMU3  | <i>Pleuraphis mutica</i>        | 0-28                 | –                |
| 6                      |                         |        |                                 | 47-94                |                  |
|                        | sand dropseed           | SPCR   | <i>Sporobolus cryptandrus</i>   | 47-94                | –                |
| 7                      |                         |        |                                 | 28-75                |                  |
|                        | threeawn                | ARIST  | <i>Aristida</i>                 | 28-75                | –                |
| 8                      |                         |        |                                 | 9-47                 |                  |

|                   |                       |       |                                              |        |   |
|-------------------|-----------------------|-------|----------------------------------------------|--------|---|
|                   | Grass, annual         | 2GA   | <i>Grass, annual</i>                         | 9-47   | – |
|                   | low woollygrass       | DAPU7 | <i>Dasyochloa pulchella</i>                  | 9-47   | – |
|                   | sand muhly            | MUAR2 | <i>Muhlenbergia arenicola</i>                | 9-47   | – |
|                   | ring muhly            | MUTO2 | <i>Muhlenbergia torreyi</i>                  | 9-47   | – |
| 9                 |                       |       |                                              | 9-28   |   |
|                   | Hall's panicgrass     | PAHA  | <i>Panicum hallii</i>                        | 9-28   | – |
|                   | plains bristlegrass   | SEVU2 | <i>Setaria vulpiseta</i>                     | 9-28   | – |
| 12                |                       |       |                                              | 9-47   |   |
|                   | Forb, perennial       | 2FP   | <i>Forb, perennial</i>                       | 9-47   | – |
| <b>Forb</b>       |                       |       |                                              |        |   |
| 10                |                       |       |                                              | 9-47   |   |
|                   | croton                | CROTO | <i>Croton</i>                                | 9-47   | – |
|                   | buckwheat             | ERIOG | <i>Eriogonum</i>                             | 9-47   | – |
|                   | white locoweed        | OXSES | <i>Oxytropis sericea</i> var. <i>sericea</i> | 9-47   | – |
|                   | whitestem paperflower | PSCO2 | <i>Psilostrophe cooperi</i>                  | 9-47   | – |
|                   | desertsenna           | SEAR8 | <i>Senna armata</i>                          | 9-47   | – |
| 11                |                       |       |                                              | 9-28   |   |
|                   | Forb, annual          | 2FA   | <i>Forb, annual</i>                          | 9-28   | – |
| <b>Shrub/Vine</b> |                       |       |                                              |        |   |
| 13                |                       |       |                                              | 94-141 |   |
|                   | winterfat             | KRLA2 | <i>Krascheninnikovia lanata</i>              | 94-141 | – |
| 14                |                       |       |                                              | 0-28   |   |
|                   | yucca                 | YUCCA | <i>Yucca</i>                                 | 0-28   | – |
| 15                |                       |       |                                              | 9-28   |   |
|                   | broom snakeweed       | GUSA2 | <i>Gutierrezia sarothrae</i>                 | 95-28  | – |
| 16                |                       |       |                                              | 0-9    |   |
|                   | mormon tea            | EPVI  | <i>Ephedra viridis</i>                       | 0-9    | – |

## Animal community

Habitat for Wildlife: This site provides habitat which can support a resident animal community characterized by pronghorn antelope, black-tailed prairie dog, spotted ground squirrel, banner-tailed kangaroo rat, tawny-bellied cotton rat, silky pocket mouse, kit fox, badger, striped skunk, burrowing owl, mockingbird, meadowlark, scaled quail, lesser earless lizard, little striped whiptail, prairie spadefoot toad, and prairie rattlesnake.

## Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups. Hydrologic Interpretations Soil Series-----Hydrologic Group Deama-----? Mion-----D Pastura-----D Penasco-----? Persajo-----? Plack-----D Pinon-----D Winona-----D

## Recreational uses

This site offers potential for horseback riding, nature observation, and hunting for pronghorn antelope and scaled quail. When favorable spring moisture conditions occur, a colorful display of wildflowers may be seen.

## Wood products

This site has no significant value for wood products.

## Other products

Grazing: This site is suitable for grazing in all season of the year. Although most of the herbage production comes during July, August, and September, green forage in the form of forbs and a few early-season grasses can be produced in significant amounts during the spring months, whenever moisture is adequate. Cool-season grasses, however, are usually the first to disappear in the event of continuous yearlong grazing. The site is adapted for cattle, sheep, and horses, generally without regard to class of livestock, although it has a tendency to become a winterfat range under strictly horse grazing and more of a grass and forb range under cattle grazing. Serious retrogression as a result of inadequately managed cattle grazing will be characterized by an increase in such plants as ring muhly, fluffgrass, broom snakeweed, and annuals, and in many cases by invading woody plants such as mesquite. Total production decreases substantially, bare ground increases, and intensive-grazing management is needed in order to effect a recovery.

## Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index-----Ac/AUM 100-76-----  
3.0-4.2 75-51-----4.0-6.5 50-26-----6.0-11.0 25-0-----11.0+

## Type locality

|                                |
|--------------------------------|
| Location 1: Grant County, NM   |
| Location 2: Catron County, NM  |
| Location 3: Hidalgo County, NM |
| Location 4: Sierra County, NM  |
| Location 5: Socorro County, NM |

## Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus and Mesas 36 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Socorro, Sierra, Grant, Catron, Hidalgo.

Characteristic Soils Are:

Pastura and Plack

Other Soils included are:

Deama, Mion, Penasco, Persajo, Pinon, Winona

## 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) | Peter A. Lefebvre |
|--------------------------|-------------------|

|                                             |                                |
|---------------------------------------------|--------------------------------|
| Contact for lead author                     | NRCS Grants Soil Survey Office |
| Date                                        | 06/14/2012                     |
| Approved by                                 |                                |
| Approval date                               |                                |
| Composition (Indicators 10 and 12) based on | Annual Production              |

## Indicators

- 1. Number and extent of rills:** Rills should be very uncommon due to high amounts of rock fragment armor on the surface and in the profile. In steeper areas without the usual rock armor, there may be a few rills due to moderate permeability, rapid runoff, and shallow depth of soils.  

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- 2. Presence of water flow patterns:** Water flow patterns may be common due to moderate permeability, rapid runoff and shallow depth of soils.  

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- 3. Number and height of erosional pedestals or terracettes:** A few pedestals and terracettes may occur, but they should be very short.  

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- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground averages 50-60%. Areas with a higher cover of rock fragments or bedrock have less bare ground. Drought may cause an increase in bare ground. This site has an average available water capacity of only 1 inch, so the potential to produce plant cover is very low.  

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- 5. Number of gullies and erosion associated with gullies:** None  

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- 6. Extent of wind scoured, blowouts and/or depositional areas:** None  

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- 7. Amount of litter movement (describe size and distance expected to travel):** Herbaceous and fine woody litter will be transported in water flow pathways. Coarse woody litter will remain under shrub and tree canopies.  

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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):** Soil aggregate stability ratings average six under plant canopy and three in interspaces. Soil surface texture is mostly loam, with a few areas of sandy loam. Surface horizon is usually gravelly to extremely gravelly. There may be 60-75% cover of rock fragments on the surface.

When well vegetated and/or protected by rock armor, soils have a high resistance to water erosion and a moderate to high resistance to wind erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is platy (weak medium) or granular (weak fine). Surface thickness is mostly 1-2 inches. Color is variable depending upon parent material.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The site is characterized by a relatively uniform distribution of mostly grasses with some shrubs and a few forbs. Some locations have an open scattered tree canopy. Canopy cover averages 35% (30% grasses, 1% forbs, 4% shrubs, 1% trees). Basal plant cover averages 7%
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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):** Soils are not generally at risk for compaction due to the high content of gravel and cobbles in the profile. In areas without much rock armor, most soils will be easily compacted. About half the soils have a naturally platy surface structure.
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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: warm season bunchgrasses >

Sub-dominant: cool season bunchgrasses = shrubs = warm season colonizing grasses >

Other: Minor: Forbs >

Additional: Trace: trees = cacti = Agave family

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**  
All plant functional groups are adapted to survival except in the most severe droughts. Severe winter droughts affect shrubs and trees the most. Severe summer droughts affect grasses the most.
- 

14. **Average percent litter cover (%) and depth ( in):** Mostly herbaceous litter with some woody litter. Litter amounts increase during the first few years of drought, then decrease in later years.
- 

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**  
250-400 pounds per acre (dry weight) in drought years, 400-550 pounds per acre in median years, 550-700 pounds per acre in wet years.
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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: Broom snakeweed and ring  
muhly are native to the site, but they have the potential to increase and dominate the area after heavy grazing. Cheatgrass is an exotic  
plant that can invade and dominate the site regardless of management.

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17. **Perennial plant reproductive capability:** All plants native to the site are adapted to the climate and are capable of producing seeds,  
stolons and rhizomes except during the most severe drought.
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