USDA Natural Resources
Conservation Service

Ecological site DX035X03F128
Clayey

Accessed: 05/11/2025

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.

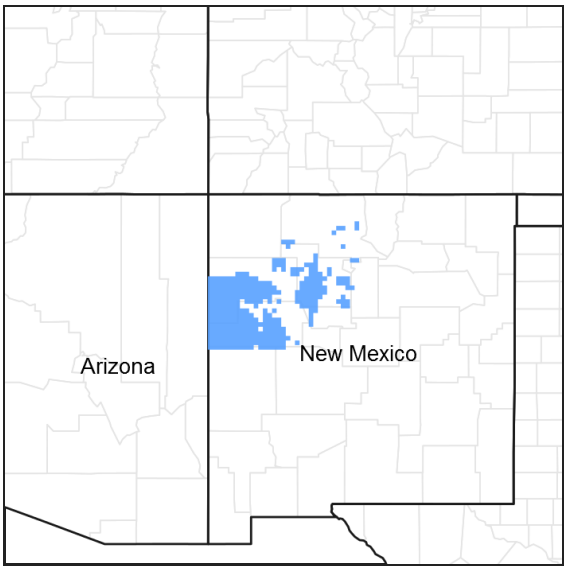


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens* (2) *Krascheninnikovia lanata*
Herbaceous	(1) *Sporobolus cryptandrus* (2) *Pascopyrum smithii*

Legacy ID

R035XA128NM

Physiographic features

This site occurs on moderately sloping valley side slopes. It can also occur as sloping benches or rolling hills above valley bottoms and floodplain positions. Slopes range from 5 to 15 percent. Elevations range from 6,000 to 7,300 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Valley side
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	5,900–7,800 ft
Slope	1–24%
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation varies from about 10 inches to just over 16 inches. Fluctuations ranging from about 5 inches to 25 inches are not uncommon. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. As much as half or more of the annual precipitation can be expected to come during the period of July through September. Thus, fall conditions are often more favorable for good growth of cool-season perennial grasses, shrubs, and forbs than are those of spring.

The average frost-free season is about 120 days and extends from approximately mid-May to early or mid-September. Average annual air temperatures are 50 degrees F or lower and summer maximums rarely exceed 100 degree F. Winter minimums typically approach or go below zero. Monthly mean temperatures exceed 70 degree F for the period of July and August.

Rainfall patterns generally favor warm-season perennial vegetation, while the temperature regime tends to favor cool-season vegetation. This creates a somewhat complex community of plants on a given range site which is quite susceptible to disturbance and is at or near its productive potential only when both the natural warm- and cool-season dominants are present.

Table 3. Representative climatic features

Frost-free period (average)	171 days
Freeze-free period (average)	252 days
Precipitation total (average)	16 in

Influencing water features

This site is not influenced by water from wetlands or streams.

Soil features

Soils are typically moderately fine to fine-textured on the surface (clay loam, clay, silty clay loam) over fine textured subsoils. They are usually deep, but may be moderately deep. Water intake rates are slow to moderately slow. Permeability is slow, and water-holding capacity is high. Runoff from this site is usually excessive in the absence of adequate vegetative cover. It may also be excessive during periods of heavy rainfall or spring snowmelt. The erosion hazard is high when the vegetative cover deteriorates.

Table 4. Representative soil features

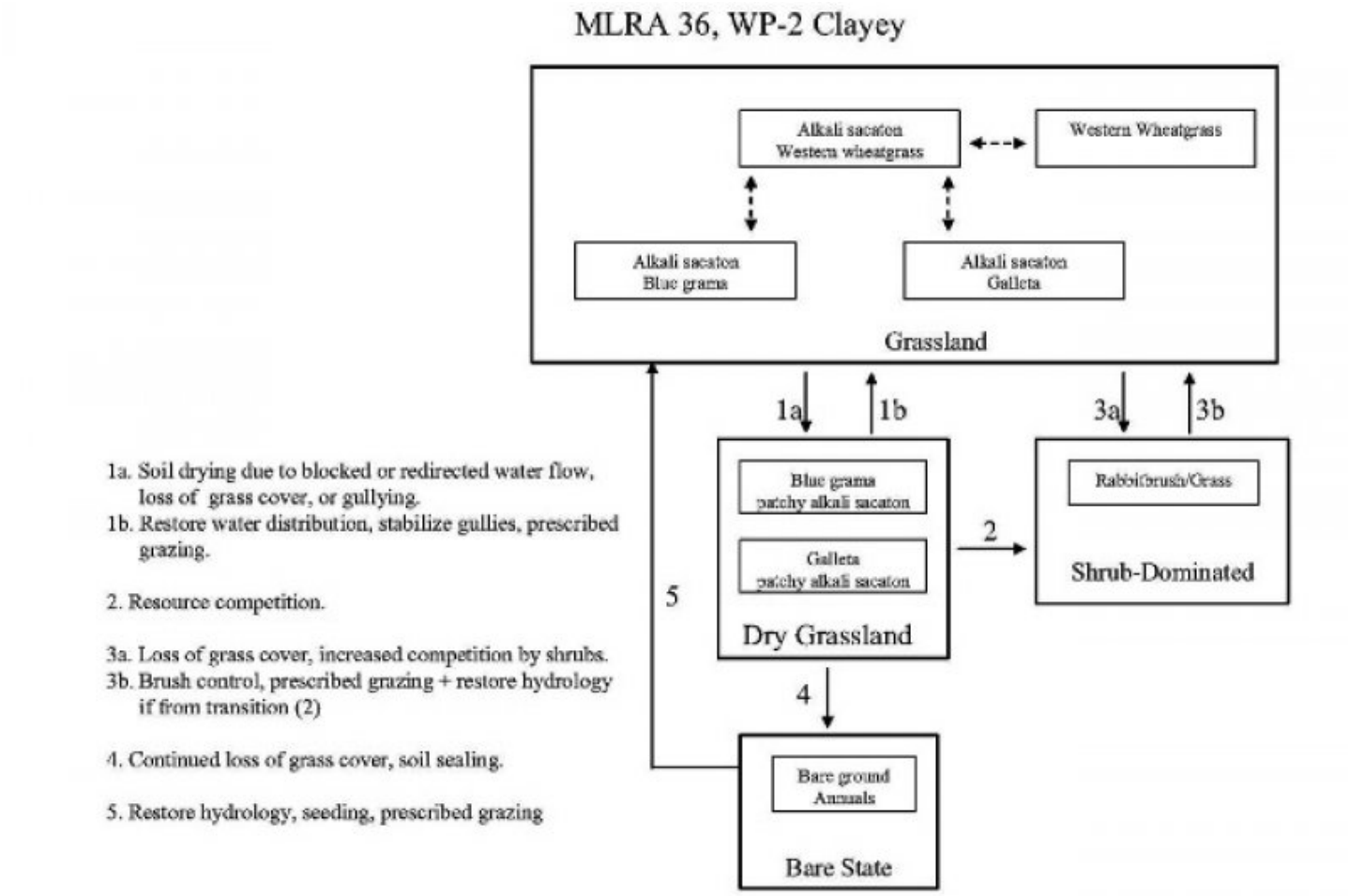
Surface texture	(1) Clay (2) Silty clay loam (3) Clay loam
Family particle size	(1) Clayey
Drainage class	Well drained

Permeability class	Very slow to moderately slow
Soil depth	20–72 in
Surface fragment cover <=3"	1–20%
Surface fragment cover >3"	0–3%
Available water capacity (0-40in)	2–8 in
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–13
Soil reaction (1:1 water) (0-40in)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	2–36%
Subsurface fragment volume >3" (Depth not specified)	0–2%

Ecological dynamics

Overview
This site occurs on flood plains, valley sides, sideslopes of hills and mesa tops. It is associated with Loamy, Clayey Bottomland, and Malpais sites. It occurs as a distinct unit adjacent to or as part of a mosaic with these sites. The historic plant community of the Clayey site is a grassland characterized by both warm and cool-season grasses, scattered shrubs, and forbs. The clayey site
is dominated by alkali sacaton and western wheatgrass. Fourwing saltbush and winterfat are common shrubs. Forbs can occur in high relative abundance in years with above-average
rainfall. Decreased available soil moisture due to blocked or redirected flow of run-on water, loss of grass cover, and gullying can cause a transition to a less productive Dry Grassland State. Continued loss of grass cover and soil surface sealing may result in a state with extensive areas of bare ground. Loss of grass cover and decreased soil moisture can decrease competition by grasses, facilitating shrub encroachment and result in a Shrub-Dominated state.

State and transition model



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

State Containing Historic Plant Community Grassland State: The historic plant community is dominated by alkali sacaton and western wheatgrass. Other important grasses that appear on this site include galleta, blue grama, and bottlebrush squirreltail. Fourwing saltbush and winterfat are the dominant shrubs. Rabbitbrush and broom snakeweed may also be sparsely scattered across the site. Continuous heavy grazing will typically cause a decrease in western wheatgrass. A community dominated by alkali sacaton with blue grama or galleta as the subdominant may result. In other instances, especially on the heavier textured clay soils, a sparser, less productive, near monotypic stand of western wheatgrass may persist. Diagnosis: Grass cover is uniform with few large bare connected areas present. Shrubs are scattered with canopy cover averaging five percent or less. Evidence of erosion such as pedestalling of grasses, rills and gullies are infrequent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	600	750	900
Shrub/Vine	80	100	120
Forb	60	75	90
Total	**740**	**925**	**1110**

Table 6. Ground cover

Tree foliar cover	0%

Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	15-25%
Forb foliar cover	1-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-15%
Surface fragments >0.25" and <=3"	1-20%
Surface fragments >3"	0-3%
Bedrock	0%
Water	0%
Bare ground	60-70%

Figure 5. Plant community growth curve (percent production by month). NM0318, R035XA128NM-Clayey-HCPC. WP-2 Clayey - HCPC Warm/Cool season perennial plant community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	8	15	10	9	20	25	8	5	0	0

State 2
Dry Grassland

Community 2.1
Dry Grassland

Additional States: Dry Grassland: This site is characterized by decreased available soil moisture, decrease in grass cover and a change in species composition. Typically galleta or blue grama is the dominant grass species. Alkali sacaton, if present, is generally found in clumps or tussocks with interconnected bare areas between plants, or in patches on wetter low-lying spots. Diagnosis: Grass cover is typically patchy with large interconnected bare areas present. Blue grama or galleta is the dominant grass species. Rills, gullies, or obstructions to overland flow are present. Transition to Dry Grassland (1a): Soil drying due to blocked or redirected flow of run-on water, loss of grass cover, or gullying are thought to initiate this transition. Water retention or diversion structures, sediment deposition, or roads may block or divert water that would naturally flow onto the site. Roads or trails may concentrate water during high flow periods and facilitate gully formation. Loss of adequate grass cover due to overgrazing can decrease infiltration, increase flow rates, and initiate gullying. Key indicators of approach to transition: * Reduction in western wheatgrass and alkali sacaton cover and increase in size and frequency of bare patches. * Increase in cover of blue grama, galleta, ring muhly and mat muhly. * The formation of trails, gullies or other features that disrupts natural overland flow Transition back to Grassland (1b) The natural hydrology of the site must be restored. Erosion control structures, shaping or filling gullies, culverts, turnouts, or moving or re-routing obstructions may be necessary to restore natural run-on flow patterns. Prescribed grazing will help restore and maintain adequate grass cover.

State 3
Shrub-Dominated

Community 3.1
Shrub-Dominated

Shrub-Dominated: This state is characterized by the predominance of shrubs, especially rabbitbrush. Broom snakeweed and cacti species may also increase in representation. Blue grama, galleta, and alkali sacaton are typically the dominant grass species. However, alkali sacaton may be sparse if the transition to this state was from the Dry Grassland. Diagnosis: Rabbitbrush is found at increased densities relative to the Grassland state. Grass cover is patchy with large bare areas present. Evidence of erosion including pedestalling of plants, elongated water

flow patterns, litter dams, and rills or gullies is common. Transition to Shrub-Dominated (2, 3a) Loss of grass cover and resulting decreased competition by grasses is believed to initiate this transition. The loss of grass cover may be due to a change in hydrology, overgrazing, or other disturbance such as fire. Rabbitbrush is believed to increase under heavy grazing pressure4 and after 1-3 years following fire5. Key indicators of approach to transition: * Decrease or change in composition or distribution of grass cover. * Increase in size and frequency of bare patches. * Increase in amount of shrub seedlings. Transition back to Grassland (3b) Brush control is necessary to initiate the transition back to the grassland state. Chemical control has been shown to be effective in controlling rabbitbrush.1,3 Root plowing and other mechanical methods that sever the plant below the root crown may reduce rabbitbrush densities. Follow up treatment may be necessary. Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover. In addition the natural hydrology of the site must be restored if the transition pathway was from Dry Grassland to Shrub- Dominated (2). See Transition Back to Grassland (1b).

State 4
Bare State

Community 4.1
Bare State

Bare State: Extensive areas of bare ground characterize this site. Surface soils in most bare areas are sealed over with physical crusts. Herbaceous cover consists mainly of annuals. If perennial grasses are present, they occur only in isolated patches. Diagnosis: Annuals are the dominant herbaceous vegetation. Extensive interconnected bare areas are common with scattered or no grass plants. Evidence of erosion such as rills and gullies are present. Transition to Bare State (4) The continued loss of remaining grass cover due to overgrazing or soil drying may cause this transition. The subsequent sealing of the soil surface by physical crusts reduces infiltration and inhibits grass reestablishment.2 Transition back to Grassland (5) The hydrology of the site must be restored first (see 1b). Seeding is necessary to reestablish grasses. Prescribed grazing will help ensure adequate rest and proper forage utilization following grass establishment. The degree to which this site is capable of recovery depends on the restoration of hydrology, the extent of degradation to soil resources, and adequate rainfall necessary to establish grasses.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				200–250	
	alkali sacaton	SPAI	*Sporobolus airoides*	200–250	–
	big sacaton	SPWR2	*Sporobolus wrightii*	200–250	–
2				200–300	
	western wheatgrass	PASM	*Pascopyrum smithii*	20–300	–
3				100–150	
	James' galleta	PLJA	*Pleuraphis jamesii*	100–150	–
4				50–200	
	blue grama	BOGR2	*Bouteloua gracilis*	50–200	–
5				0–50	
	vine mesquite	PAOB	*Panicum obtusum*	0–50	–
6				50–100	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	50–100	–
	squirreltail	ELEL5	*Elymus elymoides*	50–100	–
7				30–50	
	spike muhly	MUWR	*Muhlenbergia wrightii*	30–50	–
8				10–50	
	mat muhly	MURI	*Muhlenbergia richardsonis*	10–50	–
9				10–50	
	dropseed	SPORO	*Sporobolus*	10–50	–
Shrub/Vine					
11				50–100	
	fourwing saltbush	ATCA2	*Atriplex canescens*	50–100	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	50–100	–
12				10–50	
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	10–50	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	10–50	–
Forb					
13				10–80	
	Forb, perennial	2FP	*Forb, perennial*	10–80	–
14				10–50	
	Forb, annual	2FA	*Forb, annual*	10–50	–

Animal community

Wildlife species indigenous to this site will be added when data is available.

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
Crown clay loam----------D
Kimbeto clay loam (McKinley Co.)--------C
Moncha silty clay loam----------C
Silkie clay loam----------C
Teco variant (mapped in Cibola Co.)-----C
Las Lueas loam----------C
Moriarity silty clay----------D

Recreational uses

This site offers a limited opportunity for establishing small intermittent water areas in the form of pit tanks. It has the potential for hiking, observing wildlife, horseback riding, photography, picnicking and camping. Trail establishment for hiking or horseback riding should be selected with care. Frequently used trails could create opportunities for overland flow to channelize and form gullies.

Wood products

This site has no value for wood products.

Other information

This site is suitable for grazing by all kinds and classes of livestock. Excessive grazing use over a prolonged period will result in a decrease of alkali sacaton, western wheatgrass and spike muhly. Blue grama and galleta may increase initially, but will eventually decrease if the heavy grazing continues. The site then becomes subject to the invasion of broom snakeweed, rabbitbrush and cacti. Ring muhly, threeawns, Russian thistle and tansy mustard increase significantly. The site may become severely eroded with deep vertical walled gullies when plant cover decreases.

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index----------Ac/AUM
100-76----------3.5-4.5
75–51----------4.5-6.5
50–26----------6.5-10.0
25–0----------10.0+

Other references

1. Cluff, G.J., B.A. Roundy, R.A. Evans, and J.A. Young. 1983. Herbicidal control of greasewood (Sarcobatus vermiculatus) and salt rabbitbrush (Chrysothamnus nauseosus ssp. consimilis). Weed Science. 31: 275-279.

2. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Physical and Biological Soil Crusts. Rangeland Sheet 7 [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/rang.html

3. Whisenant, S.G. 1988. Control of threadleaf rubber rabbitbrush with herbicides. Journal of Range Management. 41: 470-472

4. Whitson, T.D. (ed.). 1999. Weeds of the West. The Western Society of Weed Science, Wyoming. pp 103

5. Wright, H. A. 1972. Shrub response to fire. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/[2004].

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus & Mesas Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: McKinley, Catron, Cibola, Socorro and Sandoval.
Characteristic Soils Are:
Crown clay loam 3-8%
Kimbeto clay loam 1-8%
Moncho silty clay loam 4-8%
Teco 4-8%
Silkie 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:**

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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):**

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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:**
