USDA Natural Resources
Conservation Service

Ecological site R034AY246CO
Clayey Slopes

Last updated: 9/07/2023
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.

MLRA notes

Major Land Resource Area (MLRA): 034A–Cool Central Desertic Basins and Plateaus

Major Land Resource Area (MLRA): 34A-Cool Central Desertic
Basins and Plateaus
For further information regarding MLRAs, refer to:
http://soils.usda.gov/survey/geography/mlra/index.html

LRU notes

Land Resource Unit (LRU) 34A-10:
• Moisture Regime: aridic ustic
• Temperature Regime: frigid
• Dominant Cover: rangeland
• Representative Value (RV) Effective Precipitation: 12-16 inches
• RV Frost-Free Days: 93-110 days

Classification relationships

Relationship to Other Established Classification Systems

Ecoregions (EPA):
Level I: 10 North American Deserts
Level II: 10.1 Cold Deserts
Level III: 10.1.4 Wyoming Basin

Ecological site concept

• This site does not receive any additional water.
• These soils:
o may be slightly saline or saline-sodic
o are moderately deep, deep, or very deep
o are not skeletal within 20” of the soil surface; and have minimal rock fragments at the soil surface
o are not strongly or violently effervescent in the surface mineral layer (within top 10”)
o have surface textures that usually range from clay loam to clay in surface mineral layer (4”)
• have slopes greater than 30 percent
• have a clay content that is greater than 35% in mineral soil surface layer (1-2”)

Associated sites

R034AY303CO	**Loamy Slopes** Similar slopes; loamy soil textures

Similar sites

DX034A02X104	**Clayey Pinedale Plateau (Cy PP)** Similar soils; lower slopes; in adjoining LRU in WY.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex confertifolia*
Herbaceous	(1) *Leymus salinus* (2) *Poa fendleriana*

Physiographic features

Topography is moderately steep to very steep and hilly with slopes ranging from 15 to 65 percent. At lower elevations and low precipitation zones, the site is on north and east facing slopes. At higher elevations and precipitation zones, the site occurs on south and west exposures. The site occurs at elevations ranging from 5500 to 7000 feet about sea level.

Table 2. Representative physiographic features

Landforms	(1) Intermontane basin > Hill
Elevation	1,676–2,134 m
Slope	15–65%
Aspect	W, S, SW

Climatic features

The average annual precipitation ranges from 12 to 16 inches with more than 50 percent of the moisture falling between April 1 and September 30. The growing season starts April 1 and ends in late September

July, August, and September are the months with the highest amount of precipitation.

Table 3. Representative climatic features

Frost-free period (characteristic range)	60-81 days
Freeze-free period (characteristic range)	93-110 days
Precipitation total (characteristic range)	305-406 mm
Frost-free period (actual range)	55-93 days
Freeze-free period (actual range)	88-110 days
Precipitation total (actual range)	305-432 mm
Frost-free period (average)	71 days
Freeze-free period (average)	102 days
Precipitation total (average)	381 mm

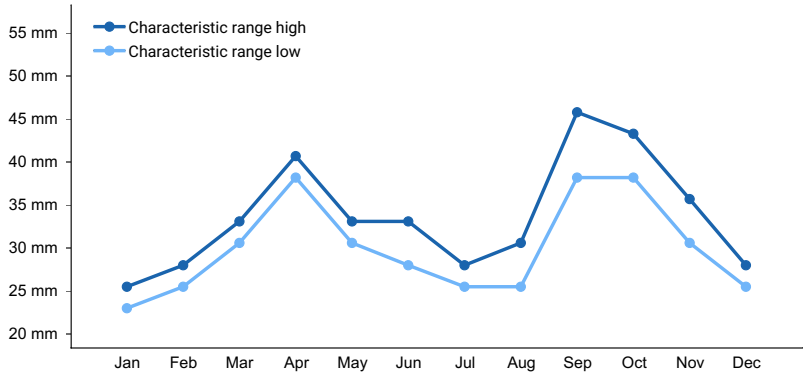


Figure 1. Monthly precipitation range

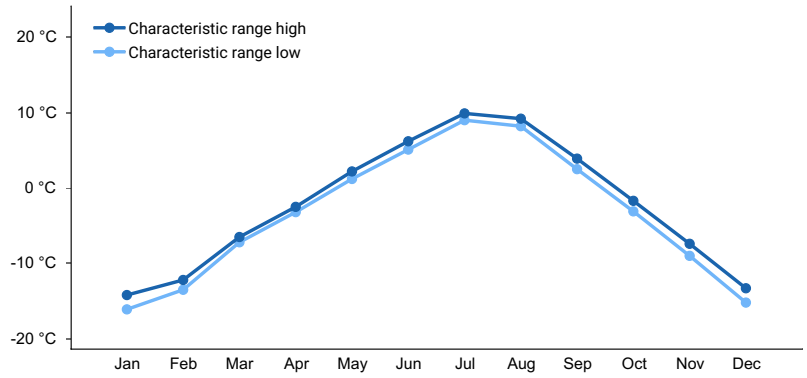


Figure 2. Monthly minimum temperature range

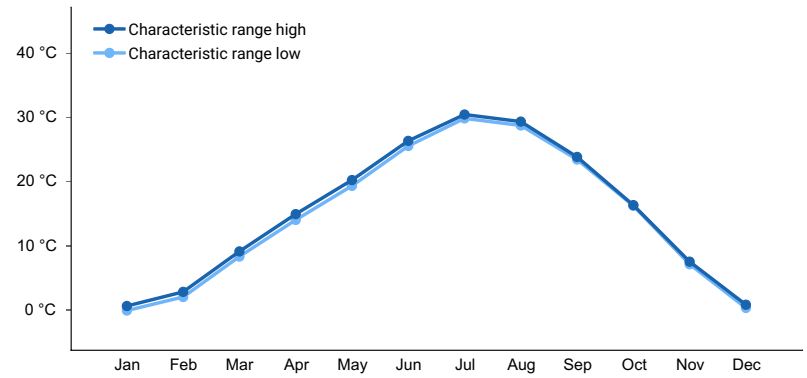


Figure 3. Monthly maximum temperature range

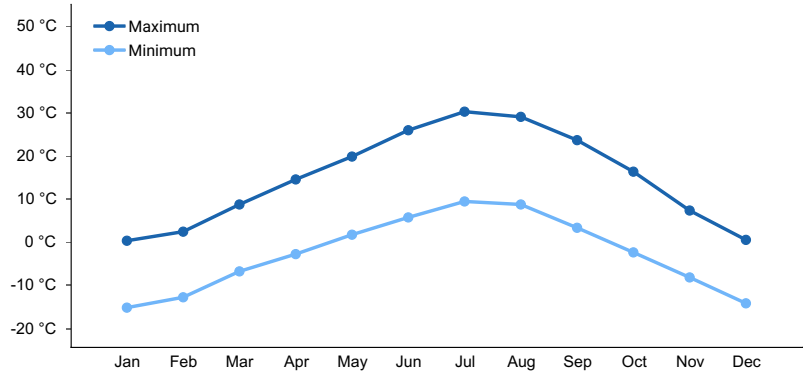


Figure 4. Monthly average minimum and maximum temperature

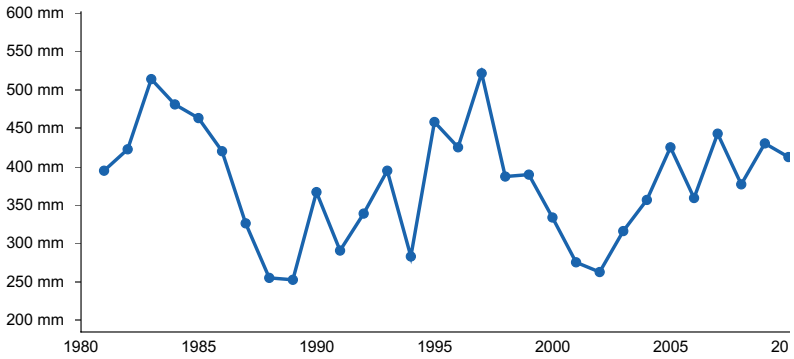


Figure 5. Annual precipitation pattern

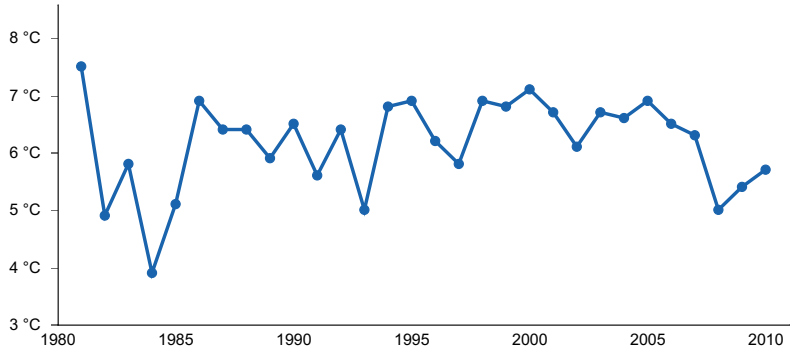


Figure 6. Annual average temperature pattern

Climate stations used

- (1) MAYBELL [USC00055446], Maybell, CO
- (2) CRAIG 4 SW [USC00051932], Hamilton, CO

Influencing water features

None

Wetland description

N/A

Soil features

Weakly developed, moderately deep, brown clay textured soils, underlain by clay shale of Wasatch or Mesa Verde age. The A1 horizon varies from two to four inches thick, and contains about 45 percent clay. The B2t layer is also clay, and is lighter colored. Permeability is better than normal for soils of clay texture. Water holding capacity is high.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Clay (2) Clay loam
Drainage class	Moderately well drained to well drained
Permeability class	Moderately rapid to very slow
Soil depth	51–203 cm
Surface fragment cover <=3"	0–15%

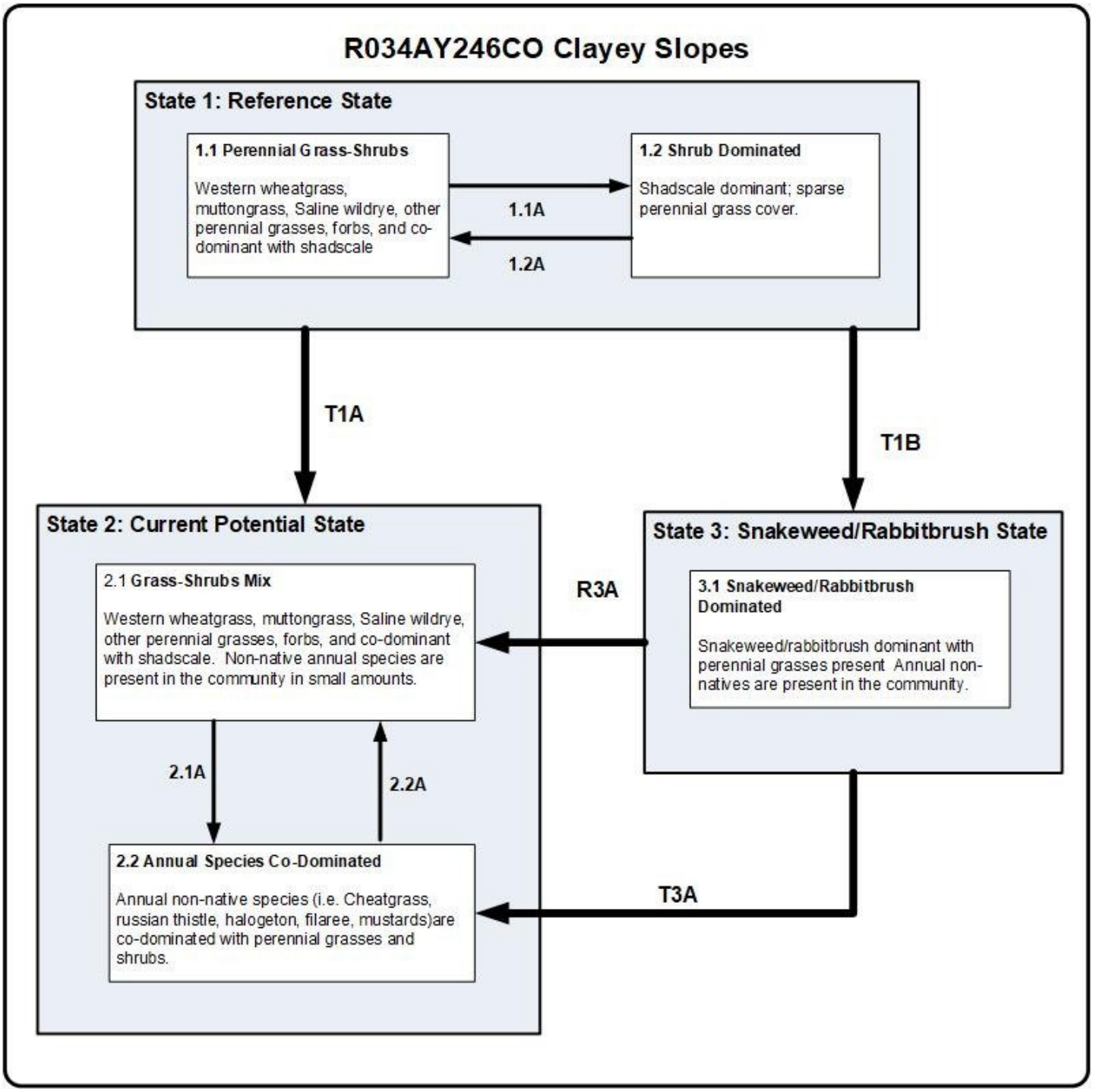
Surface fragment cover >3"	0–30%
Available water capacity (0-101.6cm)	15.24–20.32 cm
Electrical conductivity (0-50.8cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-50.8cm)	0–5
Soil reaction (1:1 water) (0-50.8cm)	6.6–8.4

Ecological dynamics

This is a grassland site with small amounts of shrubs and forbs. Dominant grasses include Salina wildrye, muttongrass, western wheatgrass, Junegrass, and squirreltail. Forbs include onion, Hoods phlox(spiny phlox), stonecrop, hollyleaf clover, fleabane, and aster. Native shrubs on the site include shadscale, big sagebrush, snowberry, serviceberry, tall rabbitbrush, low rabbitbrush, and greasewood.

Plants not native to the site that are most likely to invade are cheatgrass and other introduced plants.

State and transition model



Legend

1.1A, 2.1A – improper grazing of grasses, drought during the summer, lack of small scale fires
1.2A, 2.2A – time without disturbance, Insect and pathogen outbreaks, drought during the winter, small scale fires, proper grazing of perennial grasses, wetter climate periods during the summer
T1A – Establishment of non-native invasive plants
T1B – Surface disturbances, improper grazing, drought and/or fire
T3A – Brush treatment of rabbitbrush/snakeweed; improper grazing of perennial grasses, fire in short intervals
R3A – wetter climate cycles, proper grazing of perennial grasses, treatment of non-natives, treatment of rabbitbrush/snakeweed.

State 1
Reference State

The interpretive plant community for this site is the Reference Plant Community. This state evolved with grazing by large herbivores and is suited for grazing by domestic livestock. Potential vegetation is estimated at 65 percent grasses or grass-like plants, 15 percent forbs and 20 percent woody plants. The major grasses include western wheatgrass, mutton bluegrass, and Saline wildrye. Other grasses and grass-like plants may include bottlebrush squirreltail, prairie junegrass, and Sandberg bluegrass. Shadscale is the major woody plant. Other woody plants that may occur include yellow rabbitbrush, and serviceberry. A typical plant composition for this state consists of western wheatgrass 25 to 35 percent, mutton bluegrass 5 to 15 percent, Saline wildrye 5 to 15 percent, bottlebrush squirreltail 1 to 10 percent, other grasses and grass-like plants 10 to 20 percent, perennial forbs 5 to 15 percent, shadscale 10 to 20 percent, and 5 to 10 percent other woody species. The state is stable and well adapted to the Cool Central Desertic Basins & Plateaus climatic conditions. The diversity in plant species allow for high drought resistance. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity). Transitions or pathways leading to other plant communities are as follows: • Nonuse will convert this plant community to the Shadscale/Squirreltail State. • Heavy Continuous Season-long Grazing will convert this plant community to the Shadscale/Bare ground State.

Community 1.1
Perennial Grass - Shrubs

Plant Composition details below.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	202	404	454
Shrub/Vine	213	269	364
Forb	34	56	78
Total	**449**	**729**	**896**

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				331–476	
	western wheatgrass	PASM	*Pascopyrum smithii*	146–219	–
	muttongrass	POFE	*Poa fendleriana*	37–73	–
	saline wildrye	LESA4	*Leymus salinus*	37–73	–
	squirreltail	ELELC2	*Elymus elymoides ssp. californicus*	0–37	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–37	–
Forb					
2				39–73	
	Forb, perennial	2FP	*Forb, perennial*	0–22	–
	onion	ALLIU	*Allium*	0–22	–
	aster	ASTER	*Aster*	0–22	–
	streamside fleabane	ERGLP	*Erigeron glabellus var. pubescens*	0–22	–
	stonecrop	HYLOT	*Hylotelephium*	0–22	–
	spiny phlox	PHHO	*Phlox hoodii*	0–22	–
	hollyleaf clover	TRGY	*Trifolium gymnocarpon*	0–22	–
Shrub/Vine					
3				219–331	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	37–110	–
	Subshrub, deciduous, broadleaf	2SSDB	*Subshrub, deciduous, broadleaf*	0–37	–
	Utah serviceberry	AMUT	*Amelanchier utahensis*	0–37	–
	big sagebrush	ARTR2	*Artemisia tridentata*	0–37	–

Animal community

GRAZING INTERPRETATIONS:
This site has a medium value for grazing by sheep and cattle and low value for horses.

WILDLIFE INTERPRETATIONS:
This site offers a grazing value for antelop and elk and medium value for deer, cottontail, and jackrabbits. It has no value for bison. It offers high value for upland game birds.

Hydrological functions

The site is of medium value for watershed.

Recreational uses

It offers medium value for recreation and natural beauty.

Wood products

No known value.

Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used. Other sources used as references include: USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

Other references

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Contributors

Suzanne Mayne

Approval

Kirt Walstad, 9/07/2023

Acknowledgments

The site occurs in the Craig, Glenwood Springs, and Meeker Field Offices.

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	05/18/2024
Approved by	Kirt Walstad
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:**

17. **Perennial plant reproductive capability:**