USDA Natural Resources
Conservation Service

Ecological site R034AY300CO
Loamy Breaks

Last updated: 9/07/2023
Accessed: 05/04/2024

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: 12-15 inches
• RV Frost-Free Days: 75-95 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 are not saline or saline-sodic
o are shallow
o are skeletal within 20” of the soil surface; and have minimal rock fragments at the soil surface
o are strongly or violently effervescent in the surface mineral layer (within top 10”)
o have surface textures that usually range from loam and stony loam in surface mineral layer (4”)
• have slopes less than 25 percent
• does not have a clay content that is greater than 35% in mineral soil surface layer (1-2”)

Associated sites

R034AY298CO	**Rolling Loam**
R034AY293CO	**Sandhills**

Similar sites

R034AY420CO	**Cold Desert Breaks**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Purshia tridentata* (2) *Cercocarpus*
Herbaceous	(1) *Pseudoroegneria spicata* (2) *Hesperostipa comata*

Physiographic features

This site occupies stony ridges and canyon slopes with some rock outcroppings lying adjacent to larger Rolling Loam and Sandy Foothill range sites.

Degree of slope ranges from 3 to 25 percent. Direction of slope varies from west to south. Elevation ranges from 5500 to7000 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Plateau (3) Ridge
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	5,500–7,000 ft
Slope	3–25%
Aspect	W, S, SW

Climatic features

Annual precipitation averages from 12 to 15 inches. About half of the annual precipitation is in the form of snow. Optimum growing season for native plants is mid-April to July. Winters are typically cold. Range forage plants are favored by spring moisture from accumulated snow. July and August are usually the driest months of the growing period.

Table 3. Representative climatic features

Frost-free period (characteristic range)	53 days
Freeze-free period (characteristic range)	75-95 days
Precipitation total (characteristic range)	12-15 in
Frost-free period (actual range)	53 days
Freeze-free period (actual range)	75-95 days
Precipitation total (actual range)	12-15 in
Frost-free period (average)	53 days
Freeze-free period (average)	87 days

Precipitation total (average)	13 in

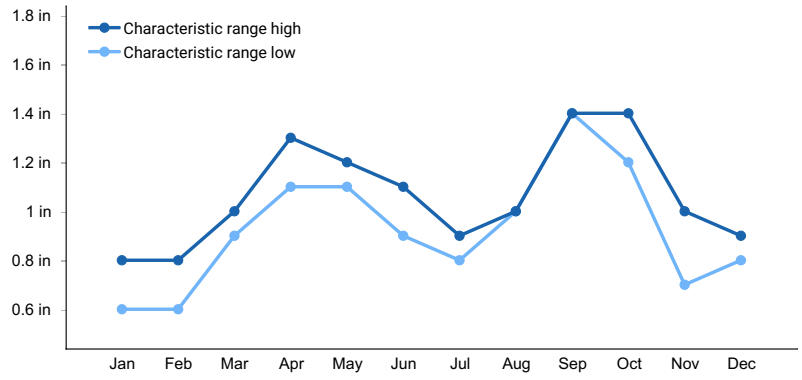


Figure 1. Monthly precipitation range

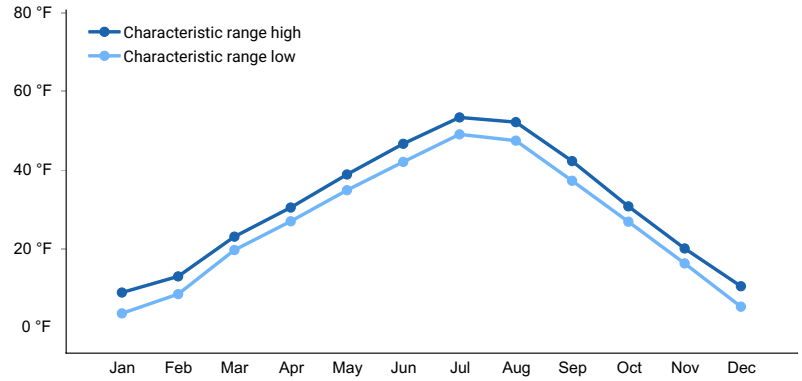


Figure 2. Monthly minimum temperature range

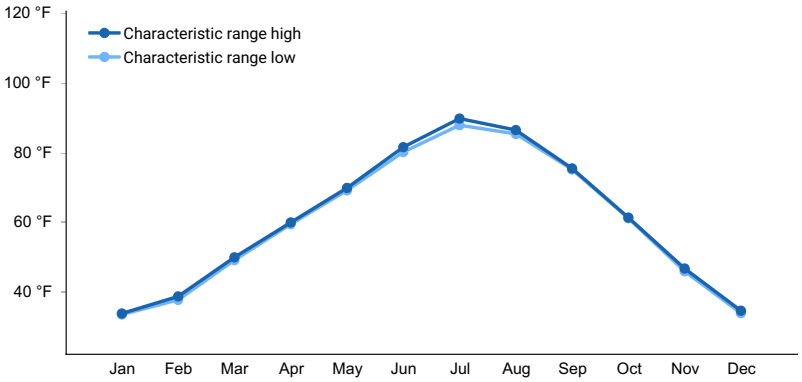


Figure 3. Monthly maximum temperature range

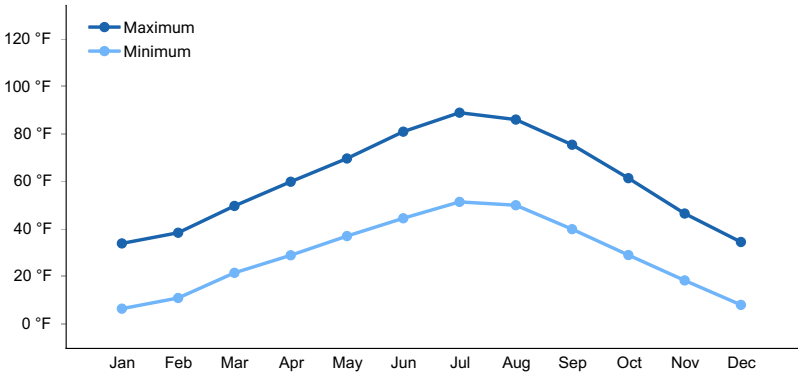


Figure 4. Monthly average minimum and maximum temperature

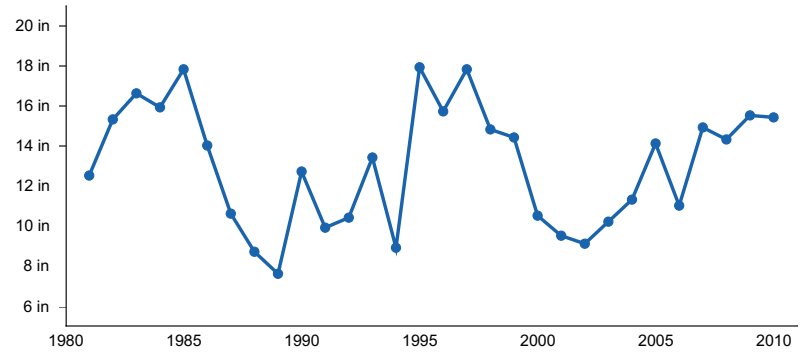


Figure 5. Annual precipitation pattern

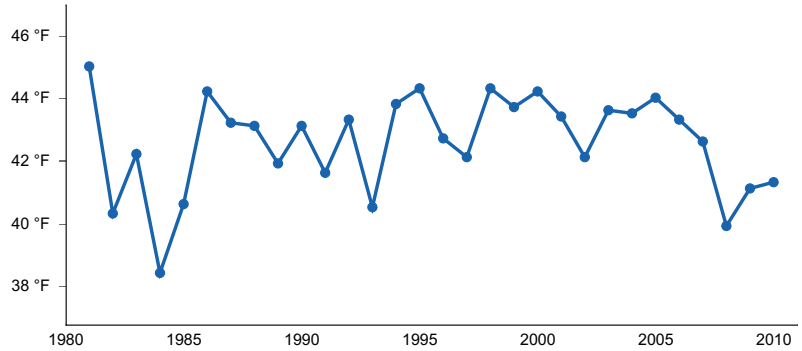


Figure 6. Annual average temperature pattern

Climate stations used

- (1) MAYBELL [USC00055446], Maybell, CO
- (2) BROWNS PARK STORE [USC00051018], Maybell, CO

Influencing water features

None

Wetland description

None

Soil features

Soils in this site are shallow, brown to dark gray brown, medium textured loam or stony loam underlaid by sandstone or shale. The soils have moderate permeability, but due to the steep slopes, the effective moisture is reduced. This is generally a droughty and unproductive site.

Soils in this site include: Crestman, Duffymont, and Tolman.

Table 4. Representative soil features

Parent material	(1) Slope alluvium (2) Residuum
Surface texture	(1) Very stony loam (2) Loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderate to rapid

Depth to restrictive layer	4–20 in
Soil depth	4–20 in
Surface fragment cover <=3"	0–30%
Surface fragment cover >3"	0–40%
Available water capacity (0-20in)	0.7–2.7 in
Calcium carbonate equivalent (0-20in)	5–15%
Soil reaction (1:1 water) (0-20in)	6.6–8.4
Subsurface fragment volume <=3" (0-20in)	0–30%
Subsurface fragment volume >3" (0-20in)	0–40%

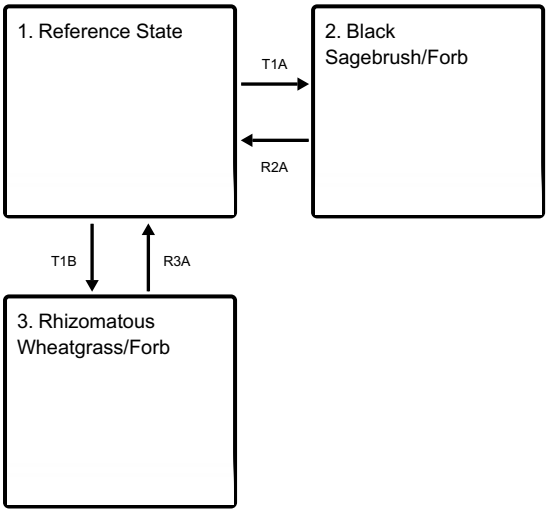
Ecological dynamics

The aspect of this site is a rather sparse stand of shrubs and grass. Bluebunch wheatgrass, needleandthread, Indian ricegrass, prairie Junegrass, western wheatgrass and bottlebrush squirreltail are the principal grass species. Shrubs of this site include antelope bitterbrush, mountain mahogany, Wyoming big sagebrush and black sagebrush. Important forbs are arrowleaf balsamroot, buckwheat, lupine, loco, and stemless goldenweed. Additional plants include native bluegrass, low rabbitbrush, gray horsebrush, serviceberry and snakeweed.

The site is treeless. Optimum ground cover is 20 percent. Invaders on this site are mainly introduced species.

State and transition model

Ecosystem states



T1A - Heavy Continuous Season-long Grazing

T1B - Continuous Season-long Grazing; Wildfire

R2A - Prescribed Grazing

R3A - Prescribed Grazing

State 1 submodel, plant communities

1.1. Reference Community Phase

State 1
Reference State

The interpretive plant community for this site is the Reference Plant Community. Potential vegetation is about 75 percent grasses or grass-like plants, 10 percent forbs, and 15 percent woody plants. The major grasses include bluebunch wheatgrass, rhizomatous wheatgrass, Indian ricegrass, needleandthread, and bottlebrush squirreltail. Other grasses include Canby, mutton, and Sandberg bluegrass, Letterman needlegrass, needleleaf sedge, plains reedgrass, and prairie junegrass. Black sagebrush is the major woody plant. Other woody plants include Wyoming big sagebrush, green rabbitbrush, and winterfat. A typical plant composition for this state consists of bluebunch wheatgrass 10 to 25 percent, rhizomatous wheatgrass 10 to 25 percent, needleandthread 5 to 15 percent, Indian ricegrass 5 to 15 percent, bottlebrush squirreltail 5 to 10 percent, other grasses and grass-like plants 10 to 20 percent, perennial forbs 5 to 10 percent, up to 10 percent black sagebrush, and 5 to 15 percent other woody species. Ground cover, by ocular estimate, varies greatly depending on the amount of exposed parent material, and herbage cover ranges from 15 to 30 percent. The total annual production (air-dry weight) of this state is about 700 pounds per acre (lbs./ac), but it can range from about 500 lbs./acre in unfavorable years to about 900 lbs./acre in above average years. This plant community is extremely stable and well adapted to the Cool Central Desertic Basins and Plateaus climatic conditions. The diversity in plant species allows for high drought tolerance. 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: • Heavy Continuous Season-long Grazing will convert this plant community to the Black Sage/Forb State. • Wildfire followed by Continuous Season-long Grazing will convert this plant community to the Rhizomatous Wheatgrass/Forb State.

Community 1.1
Reference Community Phase

Optimum ground cover is 20 percent. Invaders on this site are mainly introduced species. The plant community is made up of approximately 35 to 60 percent grasses, 5 to 15 percent forbs, and 35 to 50 percent. Total Annual Production: Favorable years 800 lbs/ac air dry Unfavorable years 400 lbs/ac air dry Median years 500 lbs/ac air dry

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	210	240	445
Shrub/Vine	170	210	275
Forb	20	50	80
Total	**400**	**500**	**800**

State 2
Black Sagebrush/Forb

State 3
Rhizomatous Wheatgrass/Forb

Transition T1A
State 1 to 2

Heavy Continuous Season-long Grazing

Transition T1B
State 1 to 3

Continuous Season-long Grazing; Wildfire

Restoration pathway R2A
State 2 to 1

Prescribed Grazing

Restoration pathway R3A
State 3 to 1

Prescribed Grazing

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				175–300	
	western wheatgrass	PASM	*Pascopyrum smithii*	50–75	–
	Sandberg bluegrass	POSE	*Poa secunda*	25–50	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	25–40	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	25–40	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–25	–
	squirreltail	ELEL5	*Elymus elymoides*	0–25	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–20	–
Forb					
2				25–75	
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	5–25	–
	lupine	LUPIN	*Lupinus*	5–25	–
	locoweed	OXYTR	*Oxytropis*	5–25	–
	stemless mock goldenweed	STAC	*Stenotus acaulis*	5–25	–
	buckwheat	ERIOG	*Eriogonum*	0–10	–
Shrub/Vine					
3				175–250	
	black sagebrush	ARNO4	*Artemisia nova*	25–75	–
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	25–75	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	25–50	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	25–50	–
	spineless horsebrush	TECA2	*Tetradymia canescens*	15–25	–
	alderleaf mountain mahogany	CEMO2	*Cercocarpus montanus*	15–25	–
	Utah serviceberry	AMUT	*Amelanchier utahensis*	15–25	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–10	–

Animal community

WILDLIFE INTERPRETATIONS:
This site offers a medium rating for antelope, deer, and jackrabbits. It offers a low rating for bison, elk, cottontail, and upland game birds.

GRAZING INTERPRETATIONS:
Thir site offers a medium value for sheep. It offers a low value for cattle and horses.

Hydrological functions

This site offers a low value for watershed.

Recreational uses

Medium value.

Wood products

None.

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.

Type locality

Location 1: Moffat County, CO	
General legal description	Open sagebrush areas near Great Divide, Moffat County, Colorado.

Other references

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Contributors

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Approval

Kirt Walstad, 9/07/2023

Acknowledgments

Field offices in Colorado where the site occurs: Craig, Eagle, Glenwood Springs, Meeker, and Steamboat Springs.

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	05/04/2024
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:**