USDA Natural Resources
Conservation Service

Ecological site R034AY236CO
Riverbottom

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: 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

The potential natural vegetation is classified as Type 235 Cottonwood Willow in Forest Cover Types in North America Society of American Foresters, 1954.

Ecological site concept

Site receives additional water.
Soils are:
not saline or saline-sodic.
Deep to very deep, not skeletal within 20” of soil surface.
Season water table <12” along seeps and springs
Not strongly or violently effervescent in surface mineral 10”.
Slope is < 30%.
Clay content is = <35% in surface mineral 4”.
Site does not have an argillic horizon with > 35% clay

Associated sites

R034AY298CO	**Rolling Loam** occurs on the upper terrace outside of the floodplain

Similar sites

R034AY374WY	**Subirrigated High Plains Southeast (Sb)** occurs in adjoining LRU in Wyoming

Table 1. Dominant plant species

Tree	(1) *Populus angustifolia*
Shrub	Not specified
Herbaceous	(1) *Leymus cinereus* (2) *Hesperostipa comata*

Physiographic features

This site will usually occur on level to nearly level land along perennial or intermittent streams near seeps, springs, and sloughs.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Stream terrace (3) Flood plain
Runoff class	Negligible to high
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,676–2,134 m
Slope	1–10%
Water table depth	30–152 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid to semi-arid. Winters are cold and summers are warm. The average annual precipitation ranges from 12 to 16 inches.

About half of this precipitation comes in the form of winter snow and spring rain. Spring and fall are peak periods of precipitation. July is usually the driest month. The distribution of precipitation and relatively low spring temperatures favor production of cool season plants.

Plants begin growth in late April. The optimum growth period is from mid-May to late June unless summer rains occur and are effective in maintaining plant growth. The growing season for native plants is about 110 days. There may be a second growth period in the fall due to a fall precipitation peak.

The average annual temperature ranges from 42 to 45 degrees Fahrenheit. The frost-free period ranges from 75 to 95 days.

Table 3. Representative climatic features

Frost-free period (characteristic range)	57-67 days

Freeze-free period (characteristic range)	88-92 days
Precipitation total (characteristic range)	305-381 mm
Frost-free period (actual range)	54-70 days
Freeze-free period (actual range)	75-95 days
Precipitation total (actual range)	305-406 mm
Frost-free period (average)	62 days
Freeze-free period (average)	90 days
Precipitation total (average)	330 mm

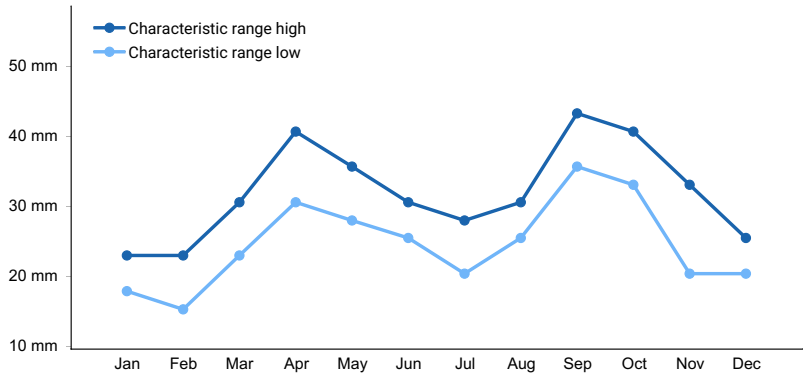


Figure 1. Monthly precipitation range

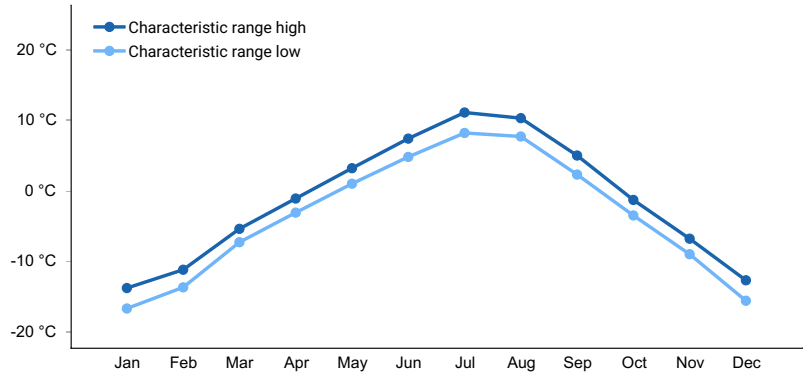


Figure 2. Monthly minimum temperature range

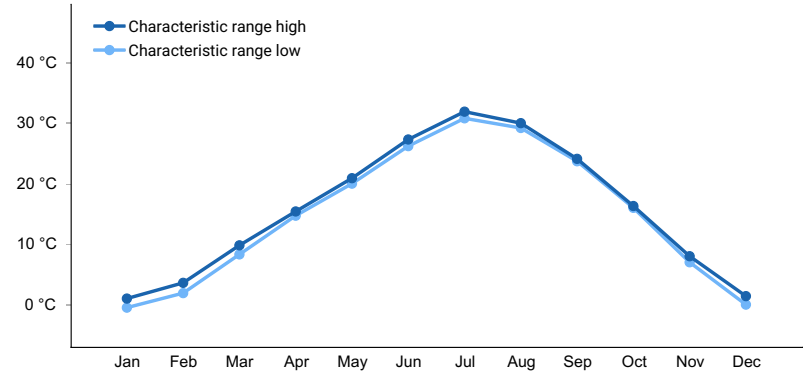


Figure 3. Monthly maximum temperature range

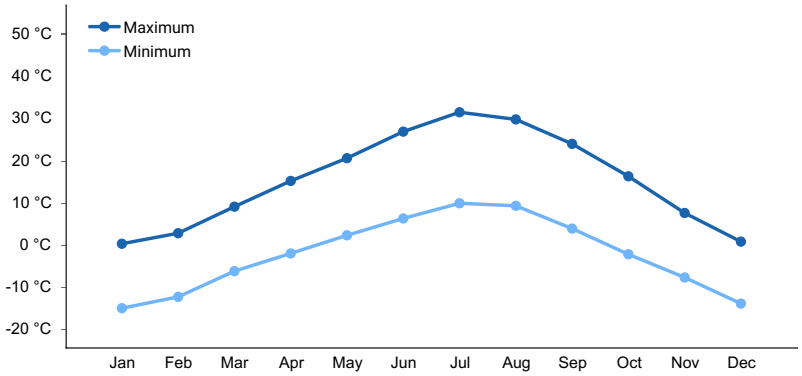


Figure 4. Monthly average minimum and maximum temperature

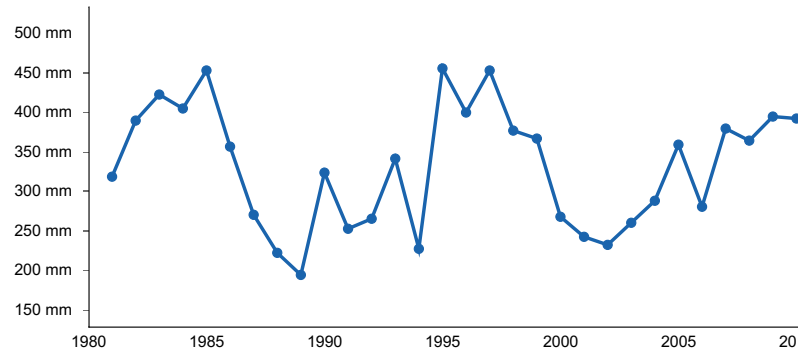


Figure 5. Annual precipitation pattern

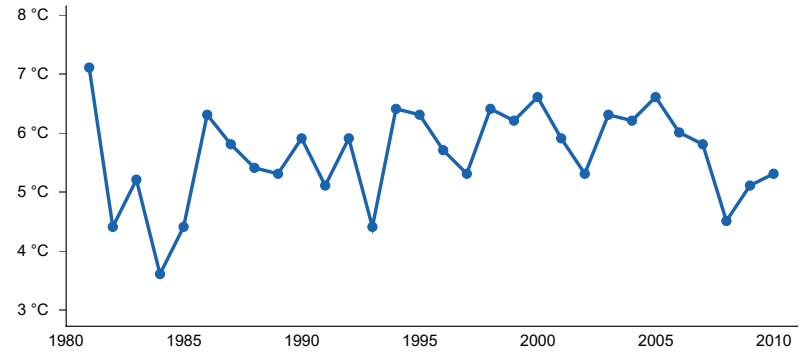


Figure 6. Annual average temperature pattern

Climate stations used

- (1) MAYBELL [USC00055446], Maybell, CO
- (2) CRAIG MOFFAT CO AP [USW00024046], Craig, CO
- (3) BROWNS PARK STORE [USC00051018], Maybell, CO

Influencing water features

The characteristics of these soils have influence from ground water that is within 12 inches of the soil surface and will be just below the surface for all of the growing season. Water over the surface from run-in may occur but only for short periods of time. These soils are moderately deep to deep and poorly to somewhat well drained.

Wetland description

N/A

Soil features

Soils of this type are those bordering major streams and tributaries. Like the vegetation, soils are highly variable.

They are commonly mapped as broadly defined units i.e. fluvaquents.

Table 4. Representative soil features

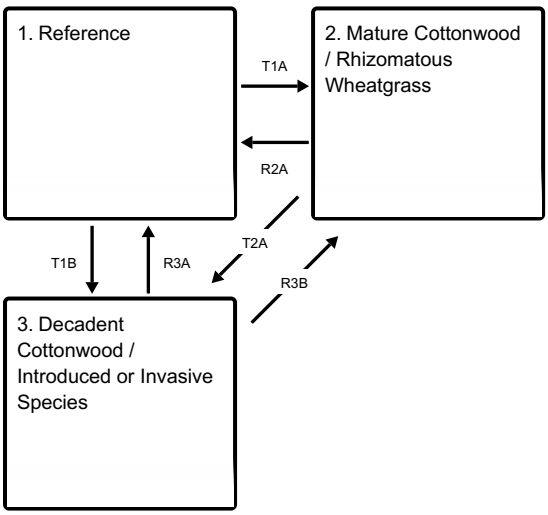
Parent material	(1) Alluvium
Surface texture	(1) Loam (2) Clay loam (3) Sandy loam
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Moderately slow to moderate
Soil depth	102–152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–15%
Available water capacity (Depth not specified)	12.7–19.05 cm
Soil reaction (1:1 water) (Depth not specified)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	0–20%
Subsurface fragment volume >3" (Depth not specified)	0–20%

Ecological dynamics

The plant species composition is highly variable. Successionally it is a sub-climax stage of the hydro-sere or a post-climax association (F. E. Clements). This type occupies the more mature flood-plains of the Green, Yampa, White, Colorado, Dolores, Uncompahgre, Gunnison, La Plata, San Juan, Rio Grande and other major streams and tributaries. Elevations are generally below 7000 feet. For conservation planning purposes, this type will not include the very narrow stream bottoms at higher elevations. Total annual production varies greatly. The under story canopy cover, periodic flooding, sediment, water-table, salinity and soils create significant variability in the nature of the plant communities. Therefore determination of annual production of grazable plants and initial stocking rates must be made on site at the time land users are assisted with resource planning.

State and transition model

Ecosystem states



State 1
Reference

Cottonwood/Cool Season Bunchgrass: The interpretive plant community for this site is the Reference Plant

Community. The major grasses include basin wildrye, needle and thread, western wheatgrass, and, Indian ricegrass. Narrowleaf cottonwood is the major woody plant. Other woody plants that may occur include Wyoming and Mountain big sagebrush, rubber rabbitbrush, and snowberry. This state is extremely stable and well adapted to the Cool Central Desertic Basins and Plateaus climate. The diversity in plant species allows for high drought resistance. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity).

State 2
Mature Cottonwood / Rhizomatous Wheatgrass

This plant community is the result of continuous season long grazing of reference. Desirable bunchgrasses such as basin wildrye and needle and thread have been greatly reduced. Young cottonwoods have been browsed and replaced with Wyoming and Mountain big sagebrush, rubber rabbitbrush and snowberry. The soils of this state are moderately protected. The loss of deep rooted perennial bunchgrasses have affected biotic integrity may be reduced due to low vegetative production. The watershed is functioning ,but is at risk of rapidly degrading with improper management.

State 3
Decadent Cottonwood / Introduced or Invasive Species

This plant community is a result of heavy continuous season-long grazing, noxious weed invasion, and flood control. The plant community is primarily composed of smooth brome, Kentucky bluegrass and non native forbs such as burdock, Canada thistle, and leafy spurge. Woody species that remain are tolerant of heavy grazing disturbance and include Wyoming and Mountain big sagebrush, rubber rabbitbrush, and snowberry. Cottonwoods have low vigor and recruitment. This state is unstable and vulnerable to excessive erosion. The biotic integrity of this plant community is at risk or non-functioning. The watershed is usually at risk or non-functioning as bare ground increases.

Transition T1A
State 1 to 2

• Continuous Season-long Grazing will convert the plant community to the Mature Cottonwood/Rhizomatous Wheatgrass

Transition T1B
State 1 to 3

• Heavy Continuous Season-long Grazing with Noxious weed invasion and flood control will convert the plant community to the Decadent Cottonwood/Introduced or Invasive Species

Restoration pathway R2A
State 2 to 1

• Prescribed Grazing or Long-term Prescribed Grazing will return this state to near Historic Climax Plant Community –Cottonwood/Cool Season Bunchgrass.

Transition T2A
State 2 to 3

• Heavy Continuous Season-long Grazing with Noxious weed invasion and flood control will convert the plant community to the Decadent Cottonwood/Introduced or Invasive Species

Restoration pathway R3A
State 3 to 1

• Long Term Prescribed Grazing, Noxious Weed Control, Return of Flood Water, Reseeding, and Replanting Trees may eventually return this state to near Reference Plant Community-Cottonwood/Cool Season Bunchgrass. Remnants of Introduced species will still be present and returning to Reference may not be economically feasible.

Restoration pathway R3B
State 3 to 2

• Long Term Prescribed Grazing, Noxious Weed Control, Return of Flood Water will return this site to a plant community similar to Mature Cottonwood / Rhizomatous Wheatgrass.

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

Colorado NRCS State Office

Approval

Kirt Walstad, 9/07/2023

Acknowledgments

This site was derived from historic Range Site in the State of Colorado.

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:

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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:**
