USDA Natural Resources Conservation Service

Ecological site R048AY244CO
Mountain Shale

Last updated: 4/03/2025
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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.

MLRA notes

Major Land Resource Area (MLRA): 048A–Southern Rocky Mountains

MLRA 48A makes up about 45,920 square miles (119,000 square kilometers) and is the southern part of the Rocky Mountains. The Southern Rocky Mountains lies east of the Colorado Plateau, south of the Wyoming Basin, west of the Great Plains, and north of the Rio Grande Rift. It is in western and central Colorado, southeastern Wyoming, eastern Utah, and northern New Mexico. The headwaters of major rivers such as the Colorado, Yampa, Arkansas, Rio Grande, North Platte and South Plate rivers are located here. This MLRA has numerous national forests, including the Medicine Bow National Forest in Wyoming; the Routt, Arapaho, Roosevelt, Pike, San Isabel, White River, Gunnison, Grand Mesa, Uncompahgre, Rio Grande, and San Juan National Forests in Colorado; the Carson National Forest and part of the Santa Fe National Forest in New Mexico. Rocky Mountain National Park also is in this MLRA.

MLRA 48A is the southern Rocky Mountains physiographic region. The Southern Rocky Mountains consist primarily of two belts of strongly sloping to precipitous mountain ranges trending north to south. Several basins, or parks, are between the belts. Some high mesas and plateaus are included. It is characterized by mountain ranges that were uplifted during the Laramide Orogeny and then had periods of glaciation. The ranges include the Sangre de Cristo Mountains, the Laramie Mountains, and the Front Range in the east and the San Juan Mountains and the Sawatch and Park Ranges in the west. The ranges are dissected by many narrow stream valleys having steep gradients. In some areas the upper mountain slopes and broad crests are covered by snowfields and glaciers. Elevation typically ranges from 6,500 to 14,400 feet (1,980 to 4,390 meters) in this area. The part of this MLRA in central Colorado includes the highest point in the Rockies, Mount Elbert, which reaches an elevation of 14,433 feet (4,400 meters). More than 50 peaks in the part of the MLRA in

Colorado are at an elevation of more than 14,000 feet (4,270 meters). Many small glacial lakes are in the high mountains.

The mountains in this area were formed mainly by crustal uplifts during the late Cretaceous and early Tertiary periods. This large MLRA can be subdivided into at least 4 large general divisions. First is the Rockies on the east side of this area are called the “Front Range,” which is a fault block that has been tilted up on edge and uplifted and is largely igneous and metamorphic geology. It was tilted up on the east edge, so there is a steep front on the east and the west side is more gently sloping and in the south east there are rocks exposed in the mountains are mostly Precambrian igneous and metamorphic rocks. Second is the tertiary rocks, primarily basalt and andesitic lava flows, tuffs, breccias, and conglomerates, are throughout this area (San Juan Mountains Area). The third division is Northwest part of the MLRA is dominantly sedimentary rock from the cretaceous/tertiary and Permian/ Pennsylvanian periods. The fourth subset is the long and narrow Sangre de Cristos mountains uplifted in the Cenozoic are between the Rio Grande rift and the great plains. Many of the highest mountain ranges were reshaped by glaciation during the Pleistocene. Alluvial fans at the base of the mountains are recharge zones for local basin and valley fill aquifers. They also are important sources of sand and gravel.

The average annual precipitation ranges predominantly from 12 to 63 inches. Summer rainfall commonly occurs as high-intensity, convective thunderstorms. About half of the annual precipitation occurs as snow in winter; this proportion increases with elevation. In the mountains, deep snowpacks accumulate throughout the winter and generally persist into spring or early summer, depending on elevation. Some permanent snowfields and small glaciers are on the highest mountain peaks. In the valleys at the lower elevations, snowfall is lighter and snowpacks can be intermittent. The average annual temperature is 26 to 54 degrees F (-3 to 12 degrees C). The freeze-free period averages 135 days and ranges from 45 to 230 days, decreasing in length with elevation. The climate of this area is strongly dependent upon elevation; precipitation is greater, and temperatures are cooler at the higher elevations. The plant communities vary with elevation, aspect and change in latitudes due to changing in precipitation kind and timing and temperature.

The dominant soil orders in this MLRA are Mollisols, Alfisols, Inceptisols, and Entisols. The soils in the area dominantly have a frigid or cryic soil temperature regime and an ustic or udic soil moisture regime. Mineralogy is typically mixed, smectitic, or paramicaceous. In areas with granite, gneiss, and schist bedrock, Glossocryalfs (Seitz, Granile, and Leadville series) and Haplocryolls (Rogert series) formed in colluvium on mountain slopes. Dystrocryepts (Leighcan and Mummy series) formed on mountain slopes and summits at the higher elevations. In areas of andesite and rhyolite bedrock, Dystrocryepts (Endlich and Whitecross series) formed in colluvium on mountain slopes. In areas of sedimentary bedrock, Haplustolls (Towave series) formed on mountain slopes at low elevations and with low precipitation. Haplocryolls (Lamphier and Razorba series), Argicryolls (Cochetopa series), and Haplocryalfs (Needleton series) formed in colluvium on mountain slopes at high elevations.

Classification relationships

NRCS:
Major Land Resource Area 48A, Southern Rocky Mountains (United States Department of Agriculture, Natural Resources Conservation Service, 2006).

USFS:

M331F- Southern Parks and Rocky Mountain Range Section Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow

M331G – South Central Highlands Section Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow

M331H – North Central Highlands and Rocky Mountains Section Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow

M331I – North Parks and Ranges Section Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow

M341B – Tavaputs Plateau Section M341 Nevada-Utah Mountains Semi-Desert - Coniferous Forest - Alpine Meadow (Cleland, et al., 2007).

EPA:

21a – Alpine Zone, 21b – Crystalline Subalpine Forests, 21c – Crystalline Mid-Elevations Forests, 21d -Foothill Shrublands, 21e – Sedimentary Subalpine Forests, 21f – Sedimentary Mid-Elevation Forests, 21g – Volcanic Subalpine Forests, and 21h – Volcanic Mid-Elevation Forests < 21 Southern Rockies < 6.2 Western Cordillera < 6 Northwestern Forested Mountains North American Deserts (Griffith, 2006).
20c – Semiarid Benchlands and Canyonlands and 20e - Escarpements < 20 Colorado Plateau < 10.1 Cold Deserts < 10 North American Deserts (Griffith, 2006).

USGS: Southern Rocky Mountain Province and the southern part of Unita Basin Section Colorado Plateaus Province

Ecological site concept

Mountain Shale occurs on valley sides, mountain sides and fans. Slopes is between 2 to 35%. Soils are moderately deep to deep (20 to 60+ inches). Soils are derived from alluvium from shale and mudstone, and/or residuum from shale and mudstone. Soil surface texture is clay loam, clay or stony clay with a fine textured subsurface. It is a mountain big sagebrush – western wheatgrass community. It has a aridic ustic moisture regime in the assigned map units. The effective precipitation ranges from 12 to 16 inches.

Associated sites

R048AY247CO	**Deep Clay Loam** Deep Clay Loam occurs on hills, hillsides, mountain-slope, complex landslides, alluvial fans, and structural benches. Slopes is between 0 to 35%. Soils are deep (60+ inches). Soils are derived from colluvium and slide deposits from igneous, metamorphic and sedimentary rocks, and/or alluvium, residuum or complex landslide deposits from shale. Soil surface texture is loam, clay loam or silty clay loam with fine-textured subsurface. It is a mountain big sagebrush – western wheatgrass community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.

Similar sites

R048AY228CO	**Mountain Loam** The surface texture of the Mountain Shale has a higher percentage of clay than the surface texture of the Mountain Loam (228). Mountain Loam occurs mainly alluvial fans, mountain slopes, benches, terraces, or hills. Slopes average between 5 and 10% but can range from 0 to 30%. Soils are moderately deep to deep (20-60 inches) loamy soils derived from residuum from igneous and metamorphic rocks or sandstone and shale; slope alluvium from sandstone and shale, or igneous and metamorphic rocks; colluvium from igneous and metamorphic rocks or sandstone and shale, and/or alluvium from igneous and metamorphic rocks. Soil surface texture are loam, sandy loam or silt loam with loamy subsurface. It is a Mountain Big Sagebrush -Arizona Fescue community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.
R048AY247CO	**Deep Clay Loam** The Deep Clay Loam (247) range site has more soil development and higher production. It also has higher production than this site. Deep Clay Loam occurs on hills, hillsides, mountain-slope, complex landslides, alluvial fans, and structural benches. Slopes is between 0 to 35%. Soils are deep (60+ inches). Soils are derived from colluvium and slide deposits from igneous, metamorphic and sedimentary rocks, and/or alluvium, residuum or complex landslide deposits from shale. Soil surface texture is loam, clay loam or silty clay loam with fine-textured subsurface. It is a mountain big sagebrush – western wheatgrass community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.
R048AY242CO	**Dry Mountain Shale** The Dry Mountain Shale (242) site has lower production than this site. The dry Mountain Shale also has less soil development and less annual precipitation than this range site. Dry Mountain Shale occurs on hills and structural benches. Slopes is between 5 to 20%. Soils are deep (60 inches or more), soils derived from colluvium from sandstone and shale; or from residuum from sandstone and shale. Soil surface texture is loamy with fine-loamy subsurface. It is a Wyoming Big Sagebrush – Western wheatgrass community. It has an aridic ustic moisture regime and a frigid temperature regime. The effective precipitation ranges from 12 to 16 inches.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. vaseyana* (2) *Amelanchier alnifolia*
Herbaceous	(1) *Pascopyrum smithii* (2) *Elymus lanceolatus ssp. lanceolatus*

Physiographic features

This site occurs on valley sides, mountainsides, and fans. The direction of slope is not generally a factor of this site. Slopes range from about 2 to 35 percent. Elevation ranges from 7000 to 8800 feet (2133 to 2652 meters).

Table 2. Representative physiographic features

Landforms	(1) Valley side (2) Mountainside (3) Fan
Runoff class	Medium to very high
Flooding frequency	None
Ponding frequency	None
Elevation	2,134–2,682 m
Slope	2–35%
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation is about 12 to 16 inches. Of this, approximately 45-55% falls as snow, and 45-55% falls as rain between middle of May to and the end of September. Summer moisture is mostly from thundershowers in July thru October. November to February and June is the driest period of the year with the driest month being June. August to October and March to April is the wettest period and the wettest month is usually April. The average annual total snowfall is 64.8 inches. The snow depth usually ranges from 1 to 5 inches during October thru April. The highest winter snowfall record in this area is 131.9 inches which occurred in 1908-1909. The lowest snowfall record is 11.9 inches during the 1944-1945 winter. The average growing season is about 140 days. Native plants green up about May 15th. Active growth continues through July 1. Plants are usually dormant by mid-October. The frost-free period typically ranges from 90 to 130 days. The last spring frost is typically the middle of May to the second week of June. The first fall frost is usually the middle of September to the end of September. Mean daily annual air temperature ranges from about 30.7ºF to 64.8ºF, averaging about 25ºF for the

winter and 66ºF in the summer. Summer high temperatures of mid-80ºF to low 80ºF are not unusual. The coldest winter temperature recorded was -36ºF on February 8, 1933 and the warmest winter temperature recorded was 66ºF on February 11, 1962. The coldest summer temperature recorded was 24ºF on June 19, 1973 and the warmest was 100ºF on August 2, 1902. Wide yearly and seasonal fluctuations are common for this climatic zone. Data taken from Western Regional Climate Center (2018) for Collbran, Colorado Climate Station.

Other:
Relative humidity in areas where this site occurs is usually very low (10 percent). Since much of the summer precipitation comes in the form of light showers, much of it evaporates before it becomes effective to the native plants.

This zone in MLRA 48 will need to be broken up into at multiple land resources zones in future projects based on current knowledge of precipitation and temperature patterns.

West Central Zone Stations: Collbran, Basalt, and Cedaredge. This LRU zone is use in write up above. November to February and June is the driest period of the year with the driest month being June. August to October and March to April is the wettest period and the wettest month is usually April. Frigid

Northwest Zone Climate Stations: Meeker#2. Driest months usually are January and February. Wettest months usually are August and September. Frigid.

Southwest Zone Climate Stations (Precambrian sedimentary and igneous): There are no climate stations in this LRU zone.

Southwest Volcanics: Lake City, Creede, and Hermit 7 ESE. These high elevation and low precipitation areas are cryic with shorter growing season days of 20 to 70 days per year. Wettest months are August and July. Driest months are December thru February.

Northeast (Front Range Igneous and Metamorphic): Grant, Estes park, Hohnholz Ranch, Leadville and Leadville 2 SW. July and August are the wettest months. January is the driest month. The climate stations is this zone are cryic. The growing seasons is 50 to 90 days.

Southeast (Sangre de Cristo Mtns): Westcliffe. Red Wing 1 WSW and Sheep Mountain. The growing season is 90 to 140 days. Driest months are December to February and the wettest are July & August. Frigid.

Table 3. Representative climatic features

Frost-free period (characteristic range)	60-103 days
Freeze-free period (characteristic range)	101-135 days

Precipitation total (characteristic range)	356-381 mm
Frost-free period (actual range)	46-112 days
Freeze-free period (actual range)	91-142 days
Precipitation total (actual range)	356-381 mm
Frost-free period (average)	81 days
Freeze-free period (average)	118 days
Precipitation total (average)	381 mm

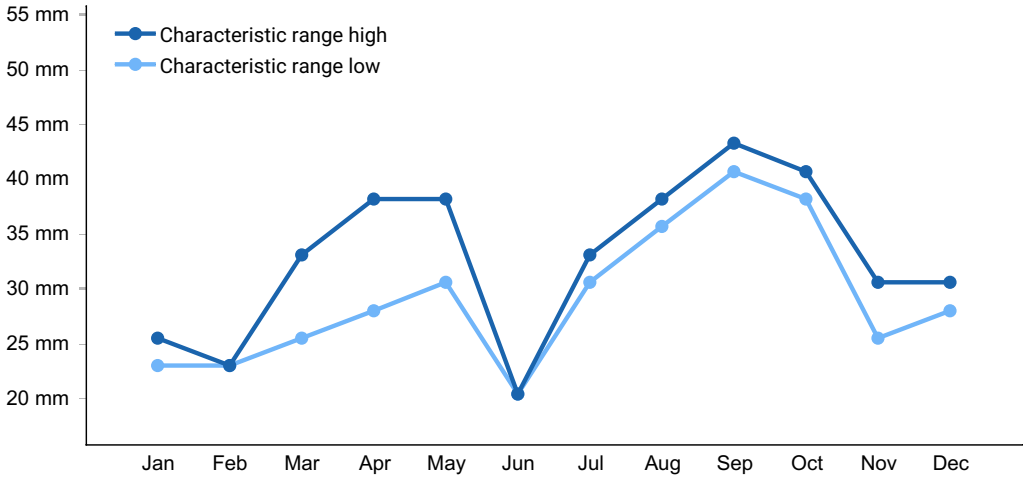


Figure 1. Monthly precipitation range

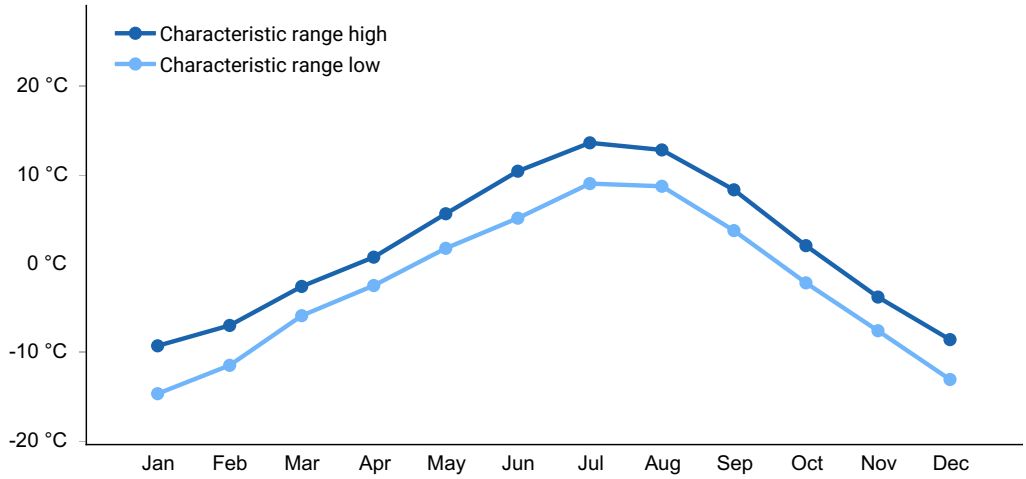


Figure 2. Monthly minimum temperature range

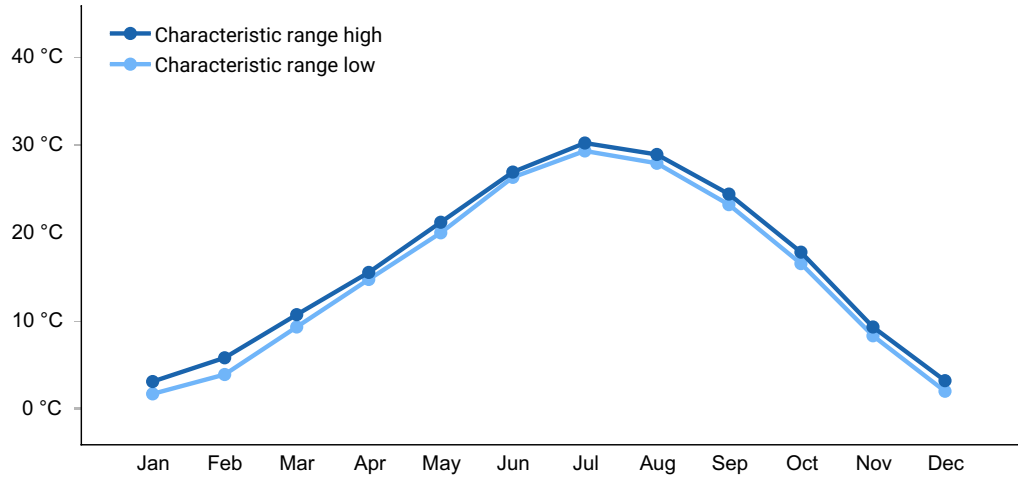


Figure 3. Monthly maximum temperature range

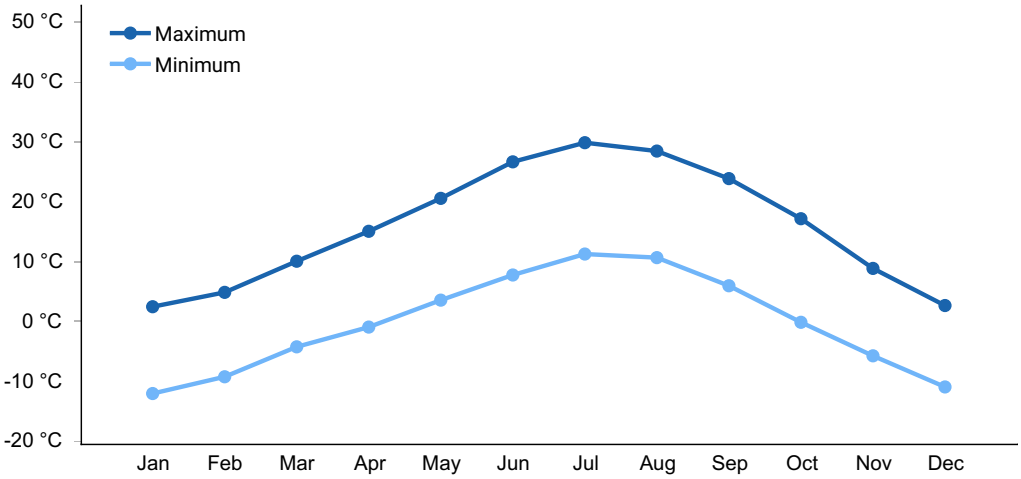


Figure 4. Monthly average minimum and maximum temperature

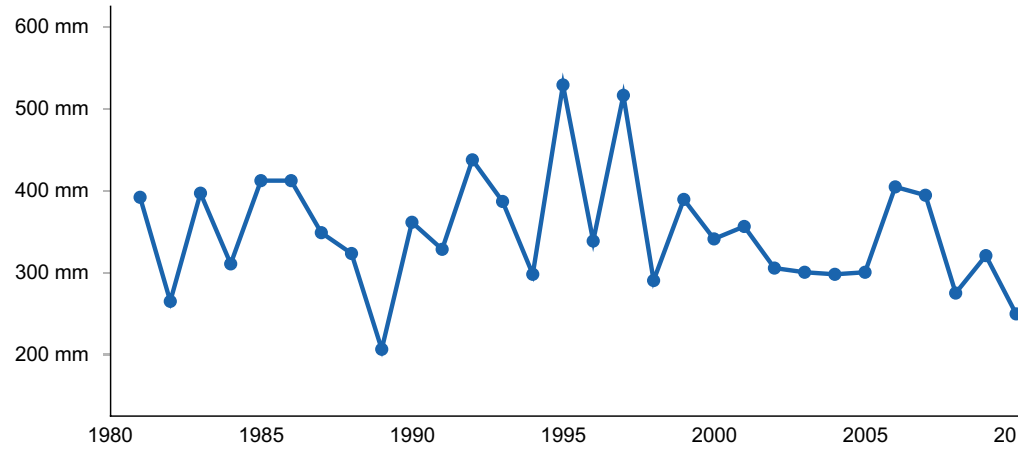


Figure 5. Annual precipitation pattern

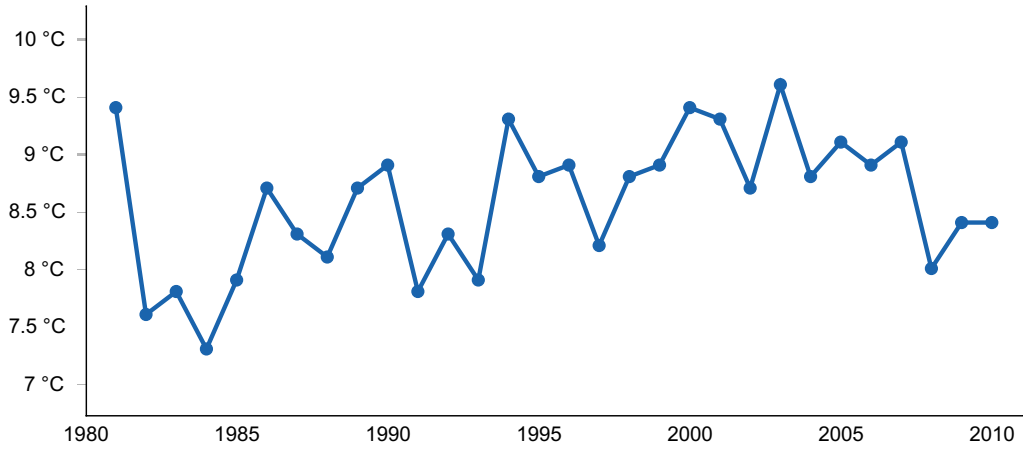


Figure 6. Annual average temperature pattern

Climate stations used

- (1) CIMARRON [USC00051609], Cimarron, CO
- (2) CEDAREDGE 3 E [USC00051443], Cedaredge, CO
- (3) COLLBRAN [USC00051741], Collbran, CO

Influencing water features

None

Soil features

Soils are usually moderately deep to deep, dark in color and have a strong shale influence. Bare exposed shale areas may be seen. Shale chips through the soil profile make some of the soils very droughty, and clayey textures cause droughty conditions in the remainder of the soils. Soils are highly erodible by water. These soils are well drained. Available water capacity is medium to high.

Soil typically assigned to this are:

Aaberg
Binco
Dollard
Kather

Table 4. Representative soil features

Parent material	(1) Alluvium–shale (2) Alluvium–mudstone (3) Residuum–shale (4) Residuum–mudstone

Surface texture	(1) Clay loam (2) Clay (3) Stony clay
Family particle size	(1) Fine
Drainage class	Well drained
Permeability class	Slow to moderately slow
Soil depth	51–152 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–20%
Available water capacity (Depth not specified)	11.43–17.02 cm
Calcium carbonate equivalent (Depth not specified)	0–5%
Sodium adsorption ratio (Depth not specified)	0–1
Soil reaction (1:1 water) (Depth not specified)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0–20%

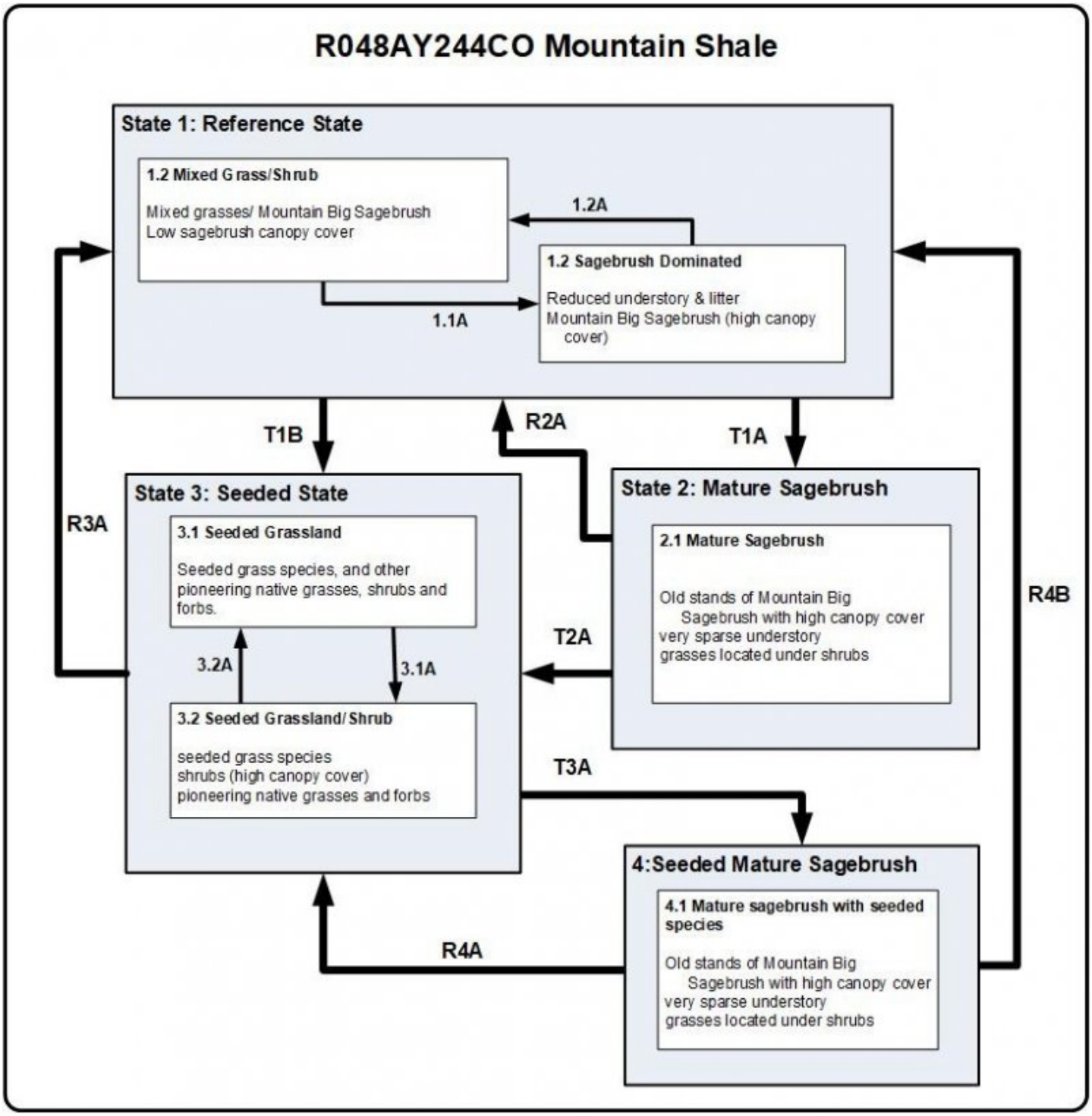
Ecological dynamics

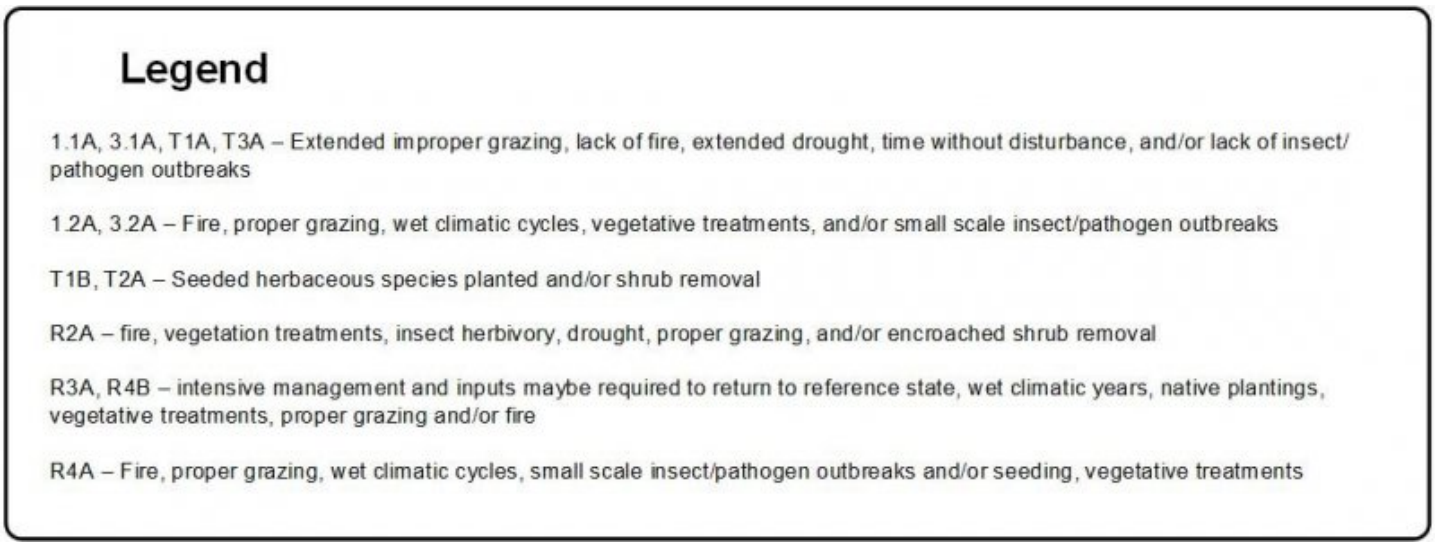
The plant community is about 60 percent grasses, 10 percent forbs and 30 percent shrubs air-dry weight.

The production is predominantly made up of wheatgrasses; however, muttongrass, prairie Junegrass and bottlebrush squirreltail can make up 15 to 30 percent. Forbs which are frequently found on the site are silvery lupine, twogrooved milkvetch, and Hoods phlox. Shrubs present on the site are mountain big sagebrush and Saskatoon serviceberry.

If ecological retrogression is cattle-induced, desirable grasses will decrease. However, if retrogression is sheep-induced, desirable forbs and shrubs may be reduced. Deterioration of this site caused by overgrazing of cattle will decrease the percentage of grasses such as muttongrass, prairie junegrass, bluebunch wheatgrass, Indian ricegrass and needleandthread. With the decrease of thses plants, bottlebursh squirreltail, streambank wheatgrass, thickspike wheatgrass and western wheatgrass will increase initially. Forbs will increase and shrubs such as mountain big sagebrush and Saskatoon serviceberry will also increase. Plant species likely to invade the site and increase in density are cheatgrass, Utah juniper, tall rabbitbrush and black greasewood.

State and transition model





State 1
Reference

Community 1.1
Reference State

The plant community is about 60 percent grasses, 10 percent forbs, and 30 percent shrubs air-dry weight. If ecological retrogression is cattle-induced, desirable grasses will decrease. However, if retrogression is sheep-induced, desirable forbs and shrubs may be reduced. Deterioration of this site caused by overgrazing of cattle will decrease the percentage of grasses such as muttongrass, prairie Junegrass, bluebunch wheatgrass, Indian ricegrass and needleandthread. With the decrease of these plants, bottlebrush squirreltail, streambank wheatgrass, thickspike wheatgrass, and western wheatgrass will increase initially. Forbs will increase and shrubs such as mountain big sagebrush and Saskatoon serviceberry will also increase. Plant species likely to invade the site and increase in density are cheatgrass, Utah juniper, tall rabbitbrush, and black greasewood. Vegetation density 1/ is approximately 10 to 20 percent. 1/ Vegetation density=basal area. This is the area of ground surface covered by the perennial stem or stems. Usually, this is measured one inch (2.54 cm) above the soil in contrast to the full spread of perennial foliage. Annual production If the range is in excellent condition, the approximate total annual production (air-dry) is: Favorable years 900 pounds/Ac 1010 Kg/Ha Normal years 650 pounds/Ac 729 Kg/Ha Unfavorable years 400 pounds/Ac 448 Kg/Ha Of this procuction, 40 percent will likely be unpalatable or out of reach to grazing animals.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	168	364	532
Shrub/Vine	213	275	364
Forb	67	90	112
Total	**448**	**729**	**1008**

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	**Grasses**			291–437	
	western wheatgrass	PASM	*Pascopyrum smithii*	112–146	–
	thickspike wheatgrass	ELLA3	*Elymus lanceolatus*	73–112	–
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	73–112	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	73–112	–
	muttongrass	POFE	*Poa fendleriana*	39–73	–
	squirreltail	ELEL5	*Elymus elymoides*	39–73	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	39–73	–
	Sandberg bluegrass	POSE	*Poa secunda*	0–39	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	0–39	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–39	–
	Letterman's needlegrass	ACLE9	*Achnatherum lettermanii*	0–39	–
Forb					
2	**Forbs**			73–112	
	twogrooved milkvetch	ASBI2	*Astragalus bisulcatus*	17–28	–
	sulphur-flower buckwheat	ERUM	*Eriogonum umbellatum*	0–28	–

	silvery lupine	LUAR3	*Lupinus argenteus*	17–28	–
	tall fringed bluebells	MECI3	*Mertensia ciliata*	0–17	–
	spiny phlox	PHHO	*Phlox hoodii*	6–17	–
	tapertip onion	ALAC4	*Allium acuminatum*	0–17	–
	white sagebrush	ARLUA	*Artemisia ludoviciana ssp. albula*	0–17	–
	Wyoming Indian paintbrush	CALI4	*Castilleja linariifolia*	0–6	–
Shrub/Vine					
3	**Shrubs**			219–331	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	112–146	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	39–73	–
	longleaf wormwood	ARLO7	*Artemisia longifolia*	0–22	–
	black sagebrush	ARNO4	*Artemisia nova*	0–22	–
	longflower rabbitbrush	CHDE2	*Chrysothamnus depressus*	6–22	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–17	–

Animal community

INTERPRETATIONS FOR LIVESTOCK:
This site is of moderate grazing value for cattle and low grazing value for sheep. Continuous year-long grazing or grazing from early spring through late fall by cattle will cause desirable plants such as bluebunch wheatgrass, muttongrass, prairie Junegrass, Indian ricegrass, and needleandthread to decrease and be replaced by less palatable plants and invaders. A system of deferred grazing, which varies the season of grazing in pastures during successive years, is needed to maintain a healthy well-balanced plant community. Rest during different parts of the growing season benefits different plants. Spring and fall rest benefits the cool-season grasses. Fall and winter rest benefits shrubs like winterfat.

INTERPRETATIONS FOR WILDLIFE:
South-facing slopes at the lower elevations of this site are often considered critical big game winter range. Higher elevations are particularly important as elk winter range. Nuttall’s cottontail, white-tailed jackrabbits, Richardson’s ground squirrel, sage grouse, Brewers sparrow, and sage sparrow can also be found on this site. Where the site is adjacent to cliffs and/or large trees, it can be an important component of golden eagle, red-tailed hawk, and American Kestrels habitat.

Hydrological functions

Soils in this site are grouped into “C” hydrologic group, as outlined in the “Soils of Colorado Loss Factors and Erodibility Hydrologic Groupings 1979” handbook. Field investigations are needed to determine hydrological cover conditions and hydrologic curve numbers. The hydrologic curve number for Group “C” soil is about 68 for all the soils except the Waybe series which is Group “D” with a hydrologic curve number of 76 when hydrologic conditions are good, as shown in “Peak Flows in Colorado” handbook.

Refer to SCS National Engineering Handbook, Section 4, to determine runoff quantities from the curves.

Recreational uses

Many flowering forbs are native to the site which are aesthetically pleasing. Camping and hunting of upland gamebirds, rabbits, coyotes, and deer provide recreation.

Other information

Endangered plants and animals:
Species names will be included as reliable information becomes available.

Major Poisonous plants to livestock that may cause poisoning:
Greasewood is poisonous in the spring. Cattle and sheep are affected.
Effects and symptoms:
Poisoning is “acute”. Early signs of poisoning (4-6 hours after animals eat toxic amounts) are dullness, loss of appetite, lowering of the head, reluctance to follow the band and irregular gait. Advanced signs are drooling, nasal discharge, progressive weakening, rapid shallow breathing, and coma. Cattle may die after eating 3 to 3.5 pounds in a short time.

Silvery lupine (Lupinus argenteus) is poisonous to all livestock occasionally. It is poisonous when other forage is scarce and if hay contains immature lupine pods (especially dangerous during seed stage). Lupine seeds are toxic to sheep when .25 to 1.5 percent of the animals body weight is consumed in one feeding. 150 to 175 gm (.33 to .38 lbs) per day has been lethal to sheep. The toxic substance is a non cumulative alkaloid. Small amounts ingested over a period of time create no difficulties.

Twogrooved milkvetch is poisonous year long especially in the spring. All livestock are affected.
Effects and symptoms:
Poisoning is “accumulative.” Signs of poisoning are rough coat, abnormal growth of long mane and tail hair, lack of coordination of muscles, constipation, and a peculiar gait.

Utah juniper

Utah juniper can only be poisonous to cattle when desirable forage is not available. Death losses from this species is rare. Stock may be poisoned if large quantities of berries are eaten.

Guide to initial stocking rates 2/

2/ Stocking rates are based on an average growing season. Based on 1200 pounds (540Kg) of forage (air-dry) per animal unit month. (This figure takes into account the vegetation that disappears through trampling, small herbivores, etc., which amounts to approximately 7.9 pounds (3.6Kg) per day under normal conditions).

Condition Percent Climax
Class Vegetation Ac/AUM AUM/AC Ha/AUM AUM/Ha
Excellent 76-100 6.7 .15 2.7 .37
Good 51-75 9.0 .11 3.6 .28
Fair 26-50 15.0 .07 6.1 .16
Poor 0-25 20+ .05- 8.1+ .12-

Field Offices
This site occurs in he Craig, Eagle, Fort Collins, Glenwood Springs, Kremmling, Meeker, Montrose, Steamboat Springs, and Walden field offices.

Type locality

Location 1: Eagle County, CO	
Township/Range/Section	TR4S RR86W SSec 8
Location 2: Pitkin County, CO	
Township/Range/Section	TT9S RR86W SSec 8
General legal description	E1/2 of SW1/4 Section 8.
Location 3: Grand County, CO	
General legal description	Just south of Kremmling on the Colorado River and east of Highway 9, Eagle Ranch.
Location 4: Routt County, CO	
General legal description	About 1/2 mile ??? off the old Hunt Creek Road, 3 miles west of Yampa on the Ed Hinman Ranch, Routt County.

Other references

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Western Regional Climate Center. Retrieved from http://www.wrcc.dri.edu/summary/Climsmco.html on Decenber 10, 2018

Contributors

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Approval

Kirt Walstad, 4/03/2025

Acknowledgments

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--Site Development and Testing Plan--:

Future work to validate and further refine the information in this Provisional Ecological Site Description is necessary. This will include field activities to collect low-, medium-, and high-intensity sampling, soil correlations, and analysis of that data.

Additional information and data is required to refine the Plant Production and Annual Production tables for this ecological site. The extent of MLRA 48A must be further investigated.

Field testing of the information contained in this Provisional ESD is required. As this ESD is moved to the Approved ESD level, reviews from the technical team, quality control, quality assurance, and peers will be conducted.

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	04/03/2025
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):**

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5. **Number of gullies and erosion associated with gullies:**

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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:

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:**