

## Ecological site R048AY253CO Wet Subalpine

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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**

48A:

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**

R048AY253CO Wet Subalpine occurs on mesa tops and swales, drainageways, glacial moraines, and alluvial fans

formed by glacial action. Slopes is between 0 to 30 percent. Soils are moderately deep to very deep (20 to 60+ inches). Soils are derived from till from basalt, andesite, or tuff; slope alluvium from andesite or tuff, alluvium from andesite or tuff; eolian deposits from basalt; or residuum from basalt. Soil surface texture is loam, or gravelly loam with fine-loamy, loamy-skeletal or clayey-skeletal textured subsurface. It is slender wheatgrass – tufted hairgrass. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 37 to 45 inches.

### Associated sites

R048AY241CO	<p><b>Mountain Meadow</b> R048AY241CO Mountain Meadow occurs flood plains, stream terraces, drainageways, ephemeral streams, flood-plain step and depressions. This site has natural sub-irrigation. Slopes is between 0 to 12%. Soils are moderately deep to very deep (20 to 60+ inches). Soils are derived from alluvium from sandstone and shale, sedimentary rock, igneous, metamorphic and sedimentary rock, or shale. Soil surface texture is loam, silty clay loam, clay loam, clay, sandy clay loam or sandy loam with fine-loamy or fine textured subsurface. It has a typic aquic or oxyaquic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.</p>
R048AY250CO	<p><b>Subalpine Loam</b> R048AY250CO Subalpine Loam occurs on hills, mountain-slopes, and mountains. Slopes is between 1 to 30%. Soils are deep to very deep (20 to 60+ inches). Soils are derived from colluvium and alluvium from volcanic rock; complex landslide deposits from igneous, metamorphic, and sedimentary rock; and slope alluvium, colluvium, residuum, alluvium or complex landslide deposits from sandstone and shale or shale. Soil surface texture is loam with loamy textured subsurface. It is a mountain big sagebrush – Thurber’s Fescue community. It has an ustic udic/typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 20 to 30 inches.</p>
R048AY304CO	<p><b>Alpine Slopes</b> R048AY304CO Alpine Slopes occurs on mountain-slopes, ridges, mountains and valleys. Slopes is between 30 to 60%. Soils are moderately deep to very deep (20 to 60+ inches). Soils are derived mostly from colluvium and alluvium from volcanic, metamorphic and igneous rocks. Soil surface texture is gravelly, very gravelly, extremely gravelly, very cobbly, extremely cobbly, or very stony loam or extremely stony sandy loam with loamy--skeletal subsurface. It is Kobresia – Tufted Hairgrass community. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 30 to 50 inches.</p>
R048AY308CO	<p><b>Shallow Alpine</b> R048AY308CO Shallow Alpine occurs mountain-slopes, ridges, mountains, basin floor, cirque floors, and valleys floors. Slopes is between 5 to 60%. Soils are shallow (7 to 20 inches). Soils are derived mostly from slope alluvium from tuff, rhyolite, andesite, basalt volcanic breccia, and other volcanic rocks; residuum from sandstone, tuff, rhyolite, volcanic breccia, basalt, andesite, and limestone; till from andesite, conglomerate or sedimentary rock; or colluvium from rhyolite, tuff, andesite, basalt, and other volcanic rocks. Soil surface texture is very gravelly, very stony, or very cobbly loam; loam; very stony or very cobbly sandy loam, or very cobbly silt loam with loamy—skeletal or loamy subsurface. It is Kobresia – Tufted Hairgrass community. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 30 to 50 inches.</p>

### Similar sites

R048AY250CO	<p><b>Subalpine Loam</b> R048AY250CO Subalpine Loam occurs on hills, mountain-slopes, and mountains. Slopes is between 1 to 30%. Soils are deep to very deep (20 to 60+ inches). Soils are derived from colluvium and alluvium from volcanic rock; complex landslide deposits from igneous, metamorphic, and sedimentary rock; and slope alluvium, colluvium, residuum, alluvium or complex landslide deposits from sandstone and shale or shale. Soil surface texture is loam with loamy textured subsurface. It is a mountain big sagebrush – Thurber’s Fescue community. It has an ustic udic/typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 20 to 30 inches.</p>
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R048AY252CO	<p><b>Subalpine Clay</b> R048AY252CO Subalpine Clay occurs on complex landslides, mountain slopes, mountainsides, and dip slopes. Slopes is between 0 to 40%. Soils are moderately deep to very deep (39to 60+ inches). Soils are derived from complex landslide deposits from igneous, metamorphic and sedimentary rock; colluvium from shale; colluvium and/or slide deposits over residuum weathered from igneous and sedimentary rock. Soil surface texture is loam, clay loam or silt loam with fine-textured subsurface. It is Thurber's Fescue – western wheatgrass – mountain snowberry. It has an ustic udic/typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 20 to 30 inches.</p>
R048AY304CO	<p><b>Alpine Slopes</b> R048AY304CO Alpine Slopes occurs on mountain-slopes, ridges, mountains and valleys. Slopes is between 30 to 60%. Soils are moderately deep to very deep (20 to 60+ inches). Soils are derived mostly from colluvium and alluvium from volcanic, metamorphic and igneous rocks. Soil surface texture is gravelly, very gravelly, extremely gravelly, very cobbly, extremely cobbly, or very stony loam or extremely stony sandy loam with loamy--skeletal subsurface. It is Kobresia – Tufted Hairgrass community. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 30 to 50 inches.</p>
R048AY305CO	<p><b>Alpine Meadow</b> R048AY305CO Alpine Meadow occurs on depressions, drainageways, cirques, flood plains and steams. Slopes is between 0 to 15%. Soils are greater than 60 inches in depth. Soils are derived mostly from colluvium from Monzonite, volcanic rock; alluvium from volcanic rocks; or slope alluvium from Andesite or latite. Soil surface texture is loam, cobbly loam or silt loam. The underlying material to a depth of 60 inches or more is variable material ranging from sandy loam to clay loam with variable amounts and sizes of rock fragments. It is Kobresia – Tufted Hairgrass community. This site has a water table at 0 to 36 inches in depth. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 30 to 50 inches.</p>
R048AY306CO	<p><b>Shrubby Alpine</b> R048AY306CO Shrubby Alpine occurs on cirque floors, mountains, mountain slopes and basin floor. Slopes is between 0 to 30%. Soils are greater than 60 inches in depth. Soils are derived mostly from till from conglomerate, sandstone or slope alluvium from basalt, rhyolite, andesite, tuff or volcanic breccia; or colluvium from andesite. Soil surface texture is very gravelly, cobbly, , or stony loam; or gravelly silt loam with loamy--skeletal subsurface. It is Kobresia – Tufted Hairgrass community. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 30 to 50 inches.</p>
R048AY308CO	<p><b>Shallow Alpine</b> R048AY308CO Shallow Alpine occurs mountain-slopes, ridges, mountains, basin floor, cirque floors, and valleys floors. Slopes is between 5 to 60%. Soils are shallow (7 to 20 inches). Soils are derived mostly from slope alluvium from tuff, rhyolite, andesite, basalt volcanic breccia, and other volcanic rocks; residuum from sandstone, tuff, rhyolite, volcanic breccia, basalt, andesite, and limestone; till from andesite, conglomerate or sedimentary rock; or colluvium from rhyolite, tuff, andesite, basalt, and other volcanic rocks. Soil surface texture is very gravelly, very stony, or very cobbly loam; loam; very stony or very cobbly sandy loam, or very cobbly silt loam with loamy—skeletal or loamy subsurface. It is Kobresia – Tufted Hairgrass community. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 30 to 50 inches.</p>
R048AY309CO	<p><b>Warm Alpine</b> R048AY309CO Warm Alpine occurs mountain-slopes, alluvial fan and valleys. Slopes is between 10 to 60%. Soils are moderately deep to very deep (20 to 60+ inches). Soils are derived mostly from alluvium from rhyolite, slope alluvium from rhyolite, tuff, sandstone and volcanic rocks or colluvium from rhyolite, tuff, and volcanic rocks. Soil surface texture very gravelly loam, loam or very stony sandy loam with loamy--skeletal subsurface. It is Thurber's Fescue community. It has a Typic udic moisture regime and cryic temperature regime. The effective precipitation ranges from 30 to 50 inches.</p>

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Elymus trachycaulus</i> (2) <i>Deschampsia cespitosa</i>

## Physiographic features

This site occurs on flat to rolling topography on mesa tops and swales, drainageways, glacial moraines, and alluvial

fans formed by glacial action. Slopes range from 0 to 30 percent. The sites occur on all slope directions. Elevation for the site ranges from 9,400 to 11,400 feet above sea level.

**Table 2. Representative physiographic features**

Landforms	(1) Mesa (2) Swale (3) Drainageway (4) Alluvial fan (5) Valley (6) Moraine
Runoff class	Medium to very high
Flooding frequency	None
Ponding frequency	None
Elevation	2,865–3,475 m
Slope	0–30%
Aspect	Aspect is not a significant factor

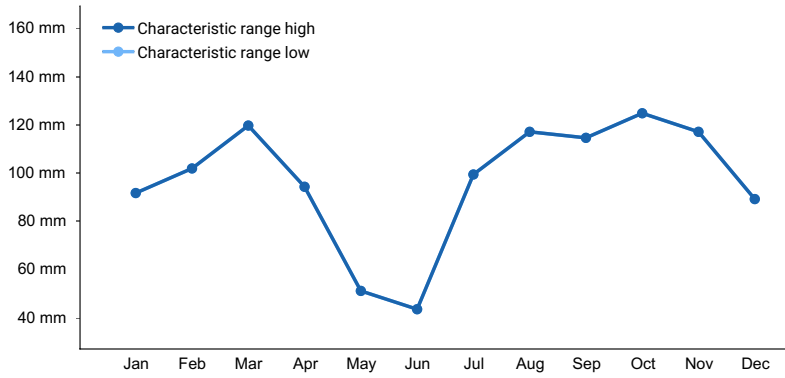
### Climatic features

The climate of this site is cold, with precipitation averaging between 37 and 45 inches annually. Of this, approximately 80-90% falls as snow, and 10-20% falls as rain between middle of June to and the middle of September 1. Summer moisture is mostly from thundershowers in July, and August. The driest period is usually from May to June; and June is normally the driest month. The average annual total snowfall is 435 inches. The snow depth usually ranges from 16 to 67 inches during November thru May. The highest winter snowfall record in this area is 807 inches which occurred in 1978-1979. The lowest snowfall record is 205 inches during the 1995-1996 winter. The frost-free period typically ranges from 54 to 96 days. The last spring frost is the middle of June to the end of June. The first fall frost is the last week of August to the middle of September. Temperatures fall below the freezing mark much of the time between October 1 through May 1. Mean daily annual air temperature is about 21.5°F to 45.9°F, averaging about 21.5°F for the winter and 54.4°F in the summer. Summer high temperatures of mid-70°F to 80°F are not unusual. The coldest winter temperature recorded was -40°F on February 5, 1982 and the warmest winter temperature recorded was 63°F on February 20, 1958. The coldest summer temperature recorded was 9°F on June 26, 1969 and the warmest was 80 °F on July 6, 1989. The hottest day on record is 81°F on September 14, 1990. Wide yearly and seasonal fluctuations are common for this climatic zone. Data taken from Western Regional Climate Center (2018) for Wolf Creek Pass 1 E, Colorado Climate Station. There are only 2 climate stations in the zone in the state of Colorado. Wolf Creek Pass 1 E and Wolf Creek Pass 4 W; they are at the lower precipitation end of this zone.

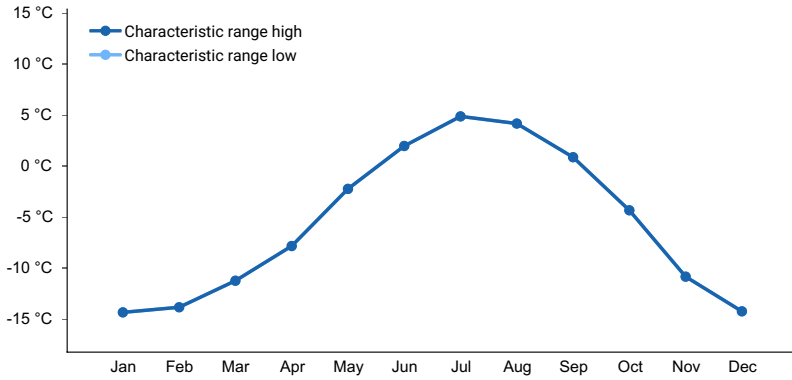
This site occurs on the Grand Mesa in areas which can be extremely windy, causing the wind chill to be extremely cold. Summer brings light afternoon showers, favorable conditions for plant growth. Cool season grasses start spring growth using moisture stored in the soil from snow melt and spring rains.

**Table 3. Representative climatic features**

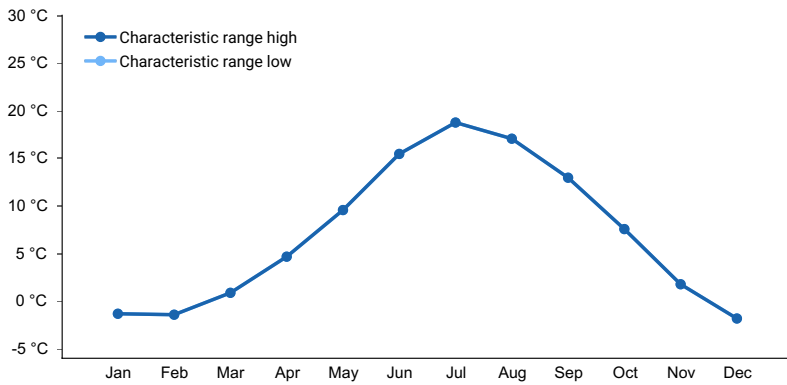
Frost-free period (characteristic range)	51 days
Freeze-free period (characteristic range)	81 days
Precipitation total (characteristic range)	1,168 mm
Frost-free period (actual range)	51 days
Freeze-free period (actual range)	81 days
Precipitation total (actual range)	1,168 mm
Frost-free period (average)	51 days
Freeze-free period (average)	81 days
Precipitation total (average)	1,168 mm



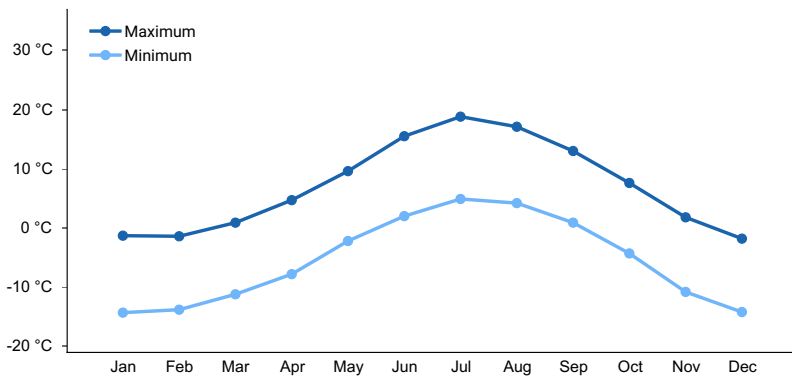
**Figure 1. Monthly precipitation range**



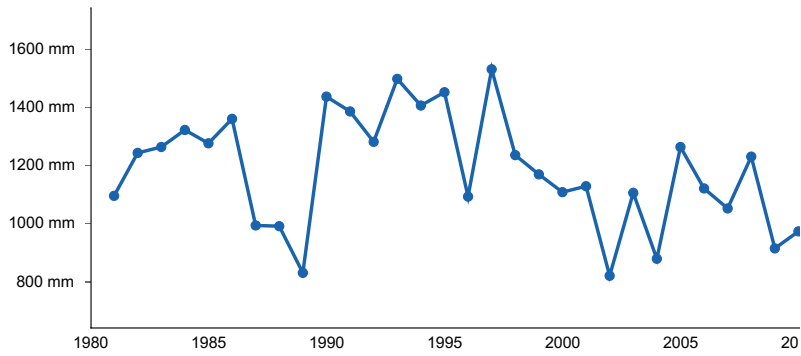
**Figure 2. Monthly minimum temperature range**



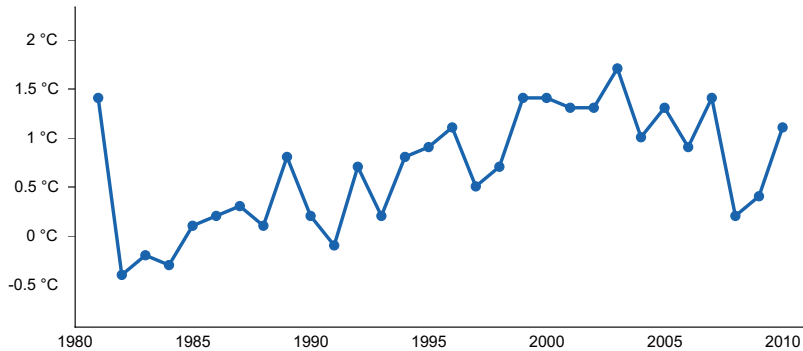
**Figure 3. Monthly maximum temperature range**



**Figure 4. Monthly average minimum and maximum temperature**



**Figure 5. Annual precipitation pattern**



**Figure 6. Annual average temperature pattern**

## Climate stations used

- (1) WOLF CREEK PASS 1 E [USC00059181], Creede, CO

## Influencing water features

None

## Soil features

Typically the soils are fine-loamy, loamy-skeletal or clayey-skeletal. The topsoil is deep and dark with base saturation ranging from 35 to 65 percent. Depth to bedrock is typically 20 to 60 inches. Temperature regime is cryic and the moisture regime is udic.

Soils associate with this site are:

Clayey-Skeletal - Castino, Doughspoon and Winnemucca

Loamy-Skeletal - Afley, warm, Namela, moist, Papaspila and Sawpit

Fine-Loamy - Bullbasin and Ohbejoyful

**Table 4. Representative soil features**

Parent material	(1) Till–basalt (2) Till–andesite (3) Eolian deposits–basalt (4) Residuuum–basalt (5) Slope alluvium–andesite (6) Alluvium–andesite (7) Alluvium–tuff (8) Slope alluvium–tuff (9) Till–tuff
Surface texture	(1) Loam (2) Gravelly loam
Family particle size	(1) Fine-loamy (2) Clayey-skeletal (3) Loamy-skeletal
Drainage class	Moderately well drained to well drained
Permeability class	Slow to moderate
Soil depth	51–152 cm
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	0–25%
Available water capacity (Depth not specified)	5.08–12.7 cm
Soil reaction (1:1 water) (Depth not specified)	6–7.3
Subsurface fragment volume <=3" (Depth not specified)	5–25%
Subsurface fragment volume >3" (Depth not specified)	10–30%

## Ecological dynamics

The plant community is about 65-70 percent grass, 20-30 percent forbs, and 5 percent shrubs (air-dry weight of current season's growth).

Dominant grasses are nodding brome, tufted hairgrass, slender wheatgrass, big bluegrass, and elk sedge. Less abundant grasses are sheep fescue and spike trisetum.

Forbs present in the plant community include herbaceous cinquefoil, geranium, aspen peavine, and orange sneezeweed.

Shrubs, half-shrubs, and trees that occur on this site are shrubby cinquefoil and Woods rose.

If retrogression is cattle induced, forbs and shrubby cinquefoil will decrease relative percentages. Also, total production and basal area will decrease, which will cause the site to be more droughty and start the initial stages of erosion. If retrogression is sheep induced, all plants will be adversely affected, causing erosion. Plants which will invade the site include hounds tongue, prostrate knotweed, rabbitbrushes, and annual forbs.

Basal area (the area of ground surface covered by the perennial vegetation measured one inch above the soil) is approximately 50 percent when near the potential plant community.

The state and transition model was added to fill the provisional ecological site instruction. It is a very general model. More field work and research is needed to make this model specific for each LRU (Land Resource Unit)

## State and transition model



# R048AY253CO Wet Subalpine

## State 1: Reference State

### 1.1 Grass Dominated

Tufted Hairgrass, slender wheatgrass, red fescue, other grasses, Richardson's geranium, slender cinquefoil, other forbs and sparse shrubs.

1.1A

### 1.2 Grass with Mixed Shrubs

Tufted Hairgrass, shrubby cinquefoil and Wood's rose increasing  
Red Fescue is decreasing

1.2A

T1A

## State 2: Current Potential State

### 2.1 Grass Dominated

Tufted Hairgrass, slender wheatgrass, red fescue, other grasses, Richardson's geranium, slender cinquefoil, other forbs and sparse shrubs. Present of introduced grasses (Sheep Fescue, Danedelion and forbs.

2.1A

### 2.2 Grasses with Mixed Shrubs

Tufted Hairgrass, Sheep fescue, shrubby cinquefoil and Wood's rose increasing  
Red Fescue is decreasing

2.2A

T2A

## State 3: Altered State

### 3.1 Grass Dominated

Seeded grass species, other grasses, shrubs and forbs. Present of introduced grasses and forbs.

3.2A

3.1A

### 3.2 Grasses with Shrubs

Seeded grass species, shrubs and forbs. Present of introduced grasses and forbs.

## Legend

1.1A, 2.1A, 3.1A – lack of fire, improper grazing, prolonged drought, time without disturbance

1.2A, 2.2A, 3.2A – disturbance, fire, insect herbivory of shrubs, proper grazing, wetter climate cycles

T1A – Establishment of non-native invasive plants

T2A – Vegetation and/or mechanical treatments of the landscape

### State 1

#### Reference State

#### Community 1.1

#### Reference State

The plant community is about 65-70 percent grass, 20-30 percent forbs, and 5 percent shrubs (air-dry weight of current seasons growth). If retrogression is cattle induced, forbs and shrubby cinquefoil will decrease relative percentages. Also, total production and basal area will decrease, which will cause the site to be more droughty and start the initial stages of erosion. If retrogression is sheep induced, all plants will be adversely affected, causing erosion. Plants which will invade the site include hounds tongue, prostrate knotweed, rabbitbrushes, and annual forbs. Basal area (the area of ground surface covered by the perennial vegetation measured one inch above the soil) is approximately 50 percent when near the potential plant community. Annual production. If the range is in excellent condition, the approximate total annual production (air-dry) is: Favorable years 3500 pounds/Ac Normal years 2000 pounds/Ac Unfavorable years 1500 pounds/Ac Of this production, 5 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	1177	1569	2746
Forb	420	560	981
Shrub/Vine	84	112	196
<b>Total</b>	<b>1681</b>	<b>2241</b>	<b>3923</b>

#### Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Grasses</b>			1457–1569	
	nodding brome	BRAN	<i>Bromus anomalus</i>	224–336	–
	tufted hairgrass	DECE	<i>Deschampsia cespitosa</i>	224–336	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	224–336	–
	sheep fescue	FEOV	<i>Festuca ovina</i>	224–336	–
	red fescue	FERU2	<i>Festuca rubra</i>	224–336	–
	spike trisetum	TRSP2	<i>Trisetum spicatum</i>	112–224	–
	Columbia needlegrass	ACNE9	<i>Achnatherum nelsonii</i>	0–112	–
	Parry's oatgrass	DAPA2	<i>Danthonia parryi</i>	0–112	–
	slender wheatgrass	ELTRS	<i>Elymus trachycaulus ssp. subsecundus</i>	0–67	–
	oniongrass	MEBU	<i>Melica bulbosa</i>	0–67	–
	alpine timothy	PHAL2	<i>Phleum alpinum</i>	0–45	–
<b>Forb</b>					
2	<b>Forbs</b>			448–673	
	slender cinquefoil	POGR9	<i>Potentilla gracilis</i>	67–112	–
	Richardson's geranium	GERI	<i>Geranium richardsonii</i>	67–112	–
	owl's-claws	HYHO	<i>Hymenoxys hoopesii</i>	45–90	–
	silvery lupine	LUAR3	<i>Lupinus argenteus</i>	45–90	–
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	22–67	–
	Colorado ragwort	SESO	<i>Senecio soldanella</i>	22–67	–
	Rocky Mountain penstemon	PEST2	<i>Penstemon strictus</i>	22–67	–
	alpine leafybract aster	SYFO2	<i>Symphyotrichum foliaceum</i>	0–45	–
	Drummond's rockcress	ARDR	<i>Arabis drummondii</i>	0–45	–
	subalpine larkspur	DEBA2	<i>Delphinium barbeyi</i>	0–45	–
	aspen fleabane	ERSP4	<i>Erigeron speciosus</i>	0–45	–
	alpine bluebells	MEAL7	<i>Mertensia alpina</i>	0–45	–
	Nevada pea	LALAL3	<i>Lathyrus lanszwertii var. leucanthus</i>	0–45	–
<b>Shrub/Vine</b>					
3	<b>Shrubs</b>			112–224	
	Woods' rose	ROWO	<i>Rosa woodsii</i>	22–45	–

## Animal community

### INTERPRETATIONS FOR GRAZING ANIMALS:

The grazing value of this site is extremely high for summer grazing. Good production and a high proportion of palatable species to both cattle and sheep. Periodic deferment, about once every four years, can help plants maintain vigor and produce a good seed crop. Long periods of deferment are not needed at this elevation (short growing season). About 4 to 6 weeks is enough – from mid to late July until the end of August is best. The site can only be used for grazing during the summer.

Stocking rates given below are based on continuous use for the entire growing season, and are intended only as an initial guide. Forage needs are calculated on the basis of 900 pounds of air-dry forage per animal unit month (AUM). To maintain proper use and allow for forage that disappears through trampling, small herbivore use, weathering,

etc., 35 percent of the palatable forage produced is considered available for grazing by large herbivores.

Condition Percent Climax  
Class Vegetation Ac/AUM AUM/Ac  
Excellent 76-100 1.4 .7  
Good 51-75 3.0 .3  
Fair 26-50 6.0 .2  
Poor 0-25 15.0 .1

Adjustment to the initial stocking rates should be made as needed to obtain proper use. With specialized grazing systems, large livestock breeds, uncontrolled big game herbivores, inaccessibility, dormant season use, etc., stocking rate adjustments will be required.

#### INTERPRETATIONS FOR WILDLIFE:

This site can be managed for existing wildlife by moderate grazing by domestic livestock. Overgrazing deteriorates the site value for wildlife.

Big game animals, elk especially and deer to a lesser extent, use this site during the summer because of the large grass and forb community. Small mammals include marmot, moles, and many others.

### Hydrological functions

This soil with high basal area protects the soil very well from raindrop impact, sheet and rill erosion. However, as range condition deteriorates, erosion can become a significant problem.

Soils in this site are grouped into the "B" hydrologic group, as outlined in the Soils of Colorado Loss Factors and Erodibility Hydrologic Groupings 1979 Handbook. Field investigations are needed to determine hydrologic cover conditions and hydrologic curve numbers. Refer to NRCS National Engineering Handbook, Section 4, and Peak Flows in Colorado Handbook for more information.

### Recreational uses

#### RECREATION AND NATURAL BEAUTY:

The site is a high quality area for recreation and natural beauty. Recreation activities such as camping, hiking, and fishing are popular summer activities. Snowmobiling and cross-country skiing are common winter activities.

### Wood products

Christmas trees may be planted on this site, however, the cold climate makes growth very slow. Trees to plant would be Englemann spruce and Subalpine fir. These trees need to be shaded when young since they are not tolerant to full sunlight when young. These same trees may also be planted for windbreaks or living snow fences. Shallow root systems will allow wind throw if trees are in thin stands.

### Other information

#### MAJOR POISONOUS PLANTS TO LIVESTOCK:<sup>3/</sup>

Orange sneezeweed can be poisonous mainly to sheep but may be to cattle and horses as well. The type of poisoning is cumulative. It is poisonous in all growth stages.

<sup>3/</sup> For additional information regarding poisoning by specific plants, see Colorado Range Technical Note.

#### ENDANGERED PLANTS AND ANIMALS:

None known at the present time.

#### OTHER INTERPRETATIONS:

The best conservation treatment of this range site is good management. The cold temperatures and short growing season make seeding establishment very difficult. The site does not generally support competitive shrubs, so management of shrubs is not needed.

Counties in which this range site occurs are Mesa and Delta.

## Type locality

Location 1: Mesa County, CO	
General legal description	Close to the west end of the Grand Mesa, Mesa County.

## Other references

### References

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## Approval

Kirt Walstad, 3/05/2024

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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	05/17/2024
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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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:

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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:**

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