

## Ecological site R048AY377CO Skeletal Loam

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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**

The Skeletal Loam Ecological Site occurs on hills, mountains, mountainsides, fan terraces, pediments, outwash

terrace and mesas. Slopes is between 5 to 55 percent. Soils are deep to very deep (40 to 60 inches or greater). Soils are derived from slope alluvium from conglomerate, sandstone, trachyte, or volcanic breccia; outwash; colluvium from volcanic rock, trachyte, or volcanic breccia or residuum from volcanic rock. Soil surface texture is usually very gravelly loam, gravelly loam, very cobbly loam or very gravelly sandy loam with loamy-skeletal or clayey skeletal textured subsurface. It is an Arizona fescue – Parry’s oatgrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 14 to 16 inches.

### Associated sites

R048AY240CO	<p><b>Shallow Pine</b> R048AY240CO Shallow Pine occurs on mountains and mountainsides. Slopes are 5 to 50%. Soils are shallow (10 to 20 inches). Soils are derived from slope alluvium from volcanic breccia, gneiss, granite, or sandstone and/or residuum from granite, granodiorite and/or gneiss. Soil surface texture is a gravelly to very gravelly sandy loam or very gravelly loam with loamy-skeletal subsurface. It is a ponderosa pine - Arizona fescue – mountain muhly community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.</p>
R048AY229CO	<p><b>Rocky Loam</b> R048AY229CO – Rocky Loam occurs on ridges, mountainside, mountain slopes and mountains. Soils are very shallow to shallow (less than 20 inches) loamy-skeletal soils derived from residuum from granite, gneiss, phyllite, schist, sandstone and/or limestone. Soil surface texture are generally coarse sandy loams to light clay loams. 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.</p>
R048AY230CO	<p><b>Shallow Loam</b> R048AY230CO – Shallow Loam occurs on mountain, hills, ridges, mountain sides and mountain slopes. Soils are very shallow to shallow (less than 20 inches) loamy-skeletal soils derived from slope alluvium from trachyte, volcanic breccia, gneiss, granite and/or sandstone; residuum from weathered volcanic breccia, tuff, igneous rock, sandstone or sandstone and shale. Soils surface textures are gravelly to very gravelly loam, gravelly to very gravelly sandy loam, cobbly loam, or very cobbly sandy loam. It is an Arizona fescue - mountain muhly community with scattered mountain mahogany, snowberry and current. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.</p>

### Similar sites

R048AY311CO	<p><b>Mountain Outwash</b> R048AY311CO Mountain Outwash occurs on fan terraces, alluvial fans, and glacial moraines. Slopes are between 3 to 45%. Soils are deep (60+ inches). Soils are derived from alluvium that is coarse-textured and stony or cobbly. Soil surface texture is gravelly sandy loam or cobbly sandy loam with sandy-skeletal textured subsurface. It is an Arizona fescue – mountain muhly community. It has a typic ustic moisture regime and frigid temperature regime. The effective precipitation ranges from 16 to 20 inches.</p>
R048AY316CO	<p><b>Dry Mountain Outwash</b> R048AY316CO Dry Mountain Outwash occurs on fan terraces and alluvial fans. Slopes is between 1 to 45%. Soils are deep (60+ inches). Soils are derived from alluvium or outwash. Soil surface texture is gravelly sandy loam with sandy-skeletal textured subsurface. It is a prairie Junegrass – pine needlegrass community.</p>
R048AY287CO	<p><b>Stony Foothills</b> R048AY287CO Stony Foothills occurs on mountains, escarpments and hills. Slopes is between 3 to 30%. Soils are moderately deep to deep (20 to 60+ inches). Soils are derived from alluvium, residuum or colluvium from sandstone and shale or alluvium from basalt. Soil surface texture is gravelly, stony, or very stony sandy loam or very cobbly loam with loamy-skeletal textured subsurface. It is a Wyoming big sagebrush – western wheatgrass community.</p>
R048AY229CO	<p><b>Rocky Loam</b> R048AY229CO – Rocky Loam occurs on ridges, mountainside, mountain slopes and mountains. Soils are very shallow to shallow (less than 20 inches) loamy-skeletal soils derived from residuum from granite, gneiss, phyllite, schist, sandstone and/or limestone. Soil surface texture are generally coarse sandy loams to light clay loams. 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.</p>

R048AY237CO	<p><b>Stony Loam</b></p> <p>R048AY237CO Stony Loam occurs mainly alluvial fans, mountain slopes mountains and valley sides. Slopes is between 0 to 30%. Soils are deep (60 inches or more) loamy soils derived from outwash; till; colluvium from basalt, sandstone or granite and gneiss; and/or alluvium from igneous and metamorphic rocks; or basalt. Soil surface texture are stony to extremely stony loam, cobbly loam; or cobbly to very cobbly sandy loam with loamy-skeletal subsurface. It is a mountain big sagebrush - bluebunch wheatgrass community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.</p>
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Festuca arizonica</i> (2) <i>Danthonia parryi</i>

### Physiographic features

This site occurs on steep mountain sides and the sides of drainages which dissect broad outwash fans of the high inter-mountain parks. Elevation ranges from 8000 to 9900 feet. Slopes range from 5 to 55 percent, with the site occurring primarily on the northern aspects in moister areas, but on southern slopes in dryer areas.

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Mountain (3) Mountainside (4) Fan terrace (5) Pediment (6) Outwash terrace (7) Mesa
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	8,000–9,900 ft
Slope	5–55%
Aspect	N, S

### Climatic features

Average annual precipitation is about 16 to 20 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, August and September. December to February is the driest period of the year with the driest month being January. July thru September is the wettest period and the wettest month is usually August. The average annual total snowfall is 84.9 inches. The snow depth usually ranges from 1 to 5 inches during November thru March. The highest winter snowfall record in this area is 127 inches which occurred in 2007-2008. The lowest snowfall record is 46.5 inches during the 2017-2018 winter. The frost-free period typically ranges from 80 to 120 days. The last spring frost is typically the middle of June to the end of June. The first fall frost is usually the end of August to the middle of September. Mean daily annual air temperature ranges from about 25.5°F to 60.3°F, averaging about 24°F for the winter and 61.8°F in the summer. Summer high temperatures of mid-70°F to low 80°F are not unusual. The coldest winter temperature recorded was -36°F on February 2, 1985 and the warmest winter temperature recorded was 65°F on December 5, 1995. The coldest summer temperature recorded was 19°F on June 2, 1990 and the warmest was 98°F on July 31, 2002. Wide yearly and seasonal fluctuations are common for this climatic zone. Data taken from Western Regional Climate Center (2018) for Ridgway, Colorado Climate Station.

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: Alterbern, Aspen, Avon, Glenwood Springs #2, Shoshone, Placerville and Ridgway. This LRU zone is use in write up above. Driest month is usually January, February and June and wettest months are July, August and September.

Northwest Zone Climate Stations: Meeker and Yampa are at the low end of this LRU zone. Driest months usually are January and February. Wettest months usually are April and August.

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

Southwest Volcanics: There are no climate stations in this LRU zone.

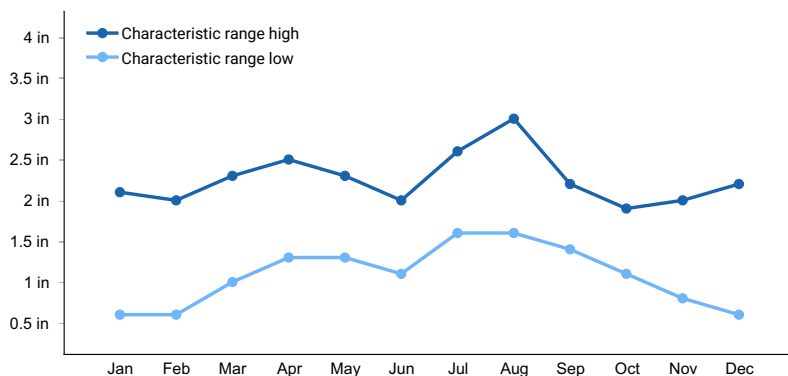
Northeast (Front Range Igneous and Metamorphic): Cabin Creek, Caribou Ranch, Dillion 1 R, Fraser, Georgetown, Grand lake 1 NW, Hourglass Reservoir, Nederland 2 NNE, Red Feathers Lakes, Red Feather Lakes 2 SE and Victor. April, May, July and August are the wettest months. February, December, November and October are the driest. The climate stations is this zone are cryic. These areas have shorter growing seasons by 20 to 40 days over the frigid stations.

Southeast (Sangre de Cristo Mtns): There are no climate stations in this zone in MLRA 48A. Closest ones are in MLRA 49. The growing season appears to be longer on the Sangre de Cristos. Driest months are December to February and the wettest are July & August.

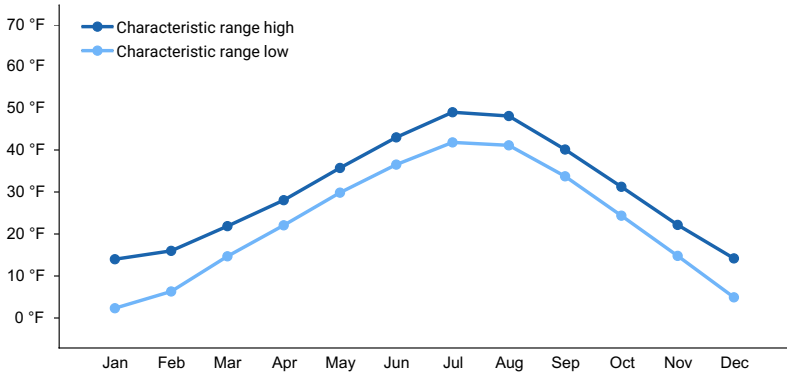
Crylic High elevation valleys: Pitkin, Taylor River and Meredith. These areas have shorter growing seasons by 20 to 40 days over the frigid stations.

**Table 3. Representative climatic features**

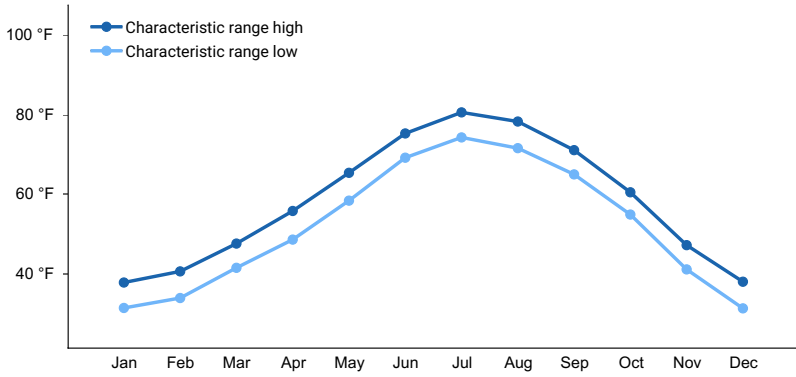
Frost-free period (characteristic range)	20-79 days
Freeze-free period (characteristic range)	72-106 days
Precipitation total (characteristic range)	15-25 in
Frost-free period (actual range)	6-92 days
Freeze-free period (actual range)	40-120 days
Precipitation total (actual range)	11-29 in
Frost-free period (average)	55 days
Freeze-free period (average)	89 days
Precipitation total (average)	20 in



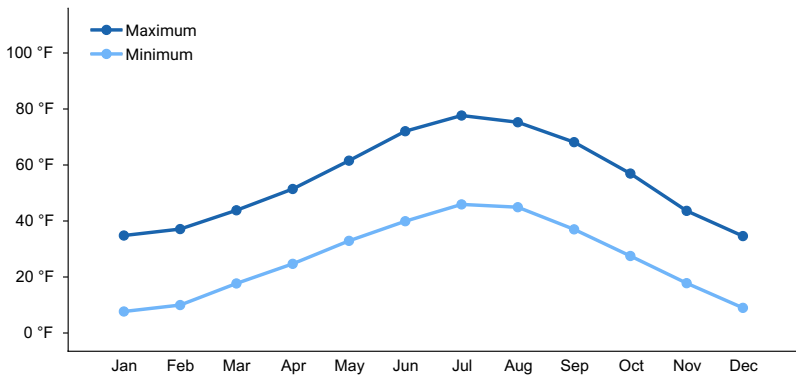
**Figure 1. Monthly precipitation range**



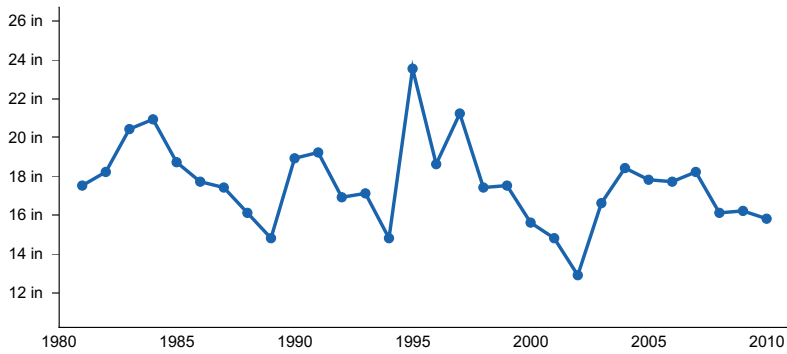
**Figure 2. Monthly minimum temperature range**



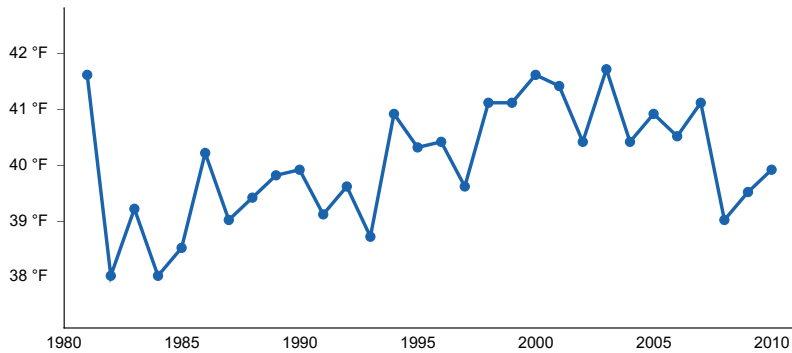
**Figure 3. Monthly maximum temperature range**



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



**Figure 5. Annual precipitation pattern**



**Figure 6. Annual average temperature pattern**

### **Climate stations used**

- (1) HOHNHOLZ RCH [USC00054054], Red Feather Lakes, CO
- (2) RUSTIC 9WSW [USC00057296], Bellvue, CO
- (3) BUCKHORN MTN 1E [USC00051060], Bellvue, CO
- (4) ESTES PARK 1 SSE [USC00052761], Estes Park, CO
- (5) BOULDER 14 W [USW00094075], Nederland, CO
- (6) COAL CREEK CANYON [USC00051681], Golden, CO
- (7) GEORGETOWN [USC00053261], Idaho Springs, CO
- (8) GRANT [USC00053530], Bailey, CO
- (9) STRONTIA SPRINGS DAM [USC00058022], Littleton, CO
- (10) CHEESMAN [USC00051528], Sedalia, CO
- (11) RUXTON PARK [USC00057309], Pike Ntl Forest, CO
- (12) LAKE GEORGE 8 SW [USC00054742], Lake George, CO
- (13) WESTCLIFFE [USC00058931], Westcliffe, CO
- (14) EAGLE NEST [USC00292700], Eagle Nest, NM
- (15) GASCON [USC00293488], Mora, NM
- (16) LOS ALAMOS 13 W [USW00003062], Jemez Springs, NM
- (17) WOLF CREEK PASS 1 E [USC00059181], Creede, CO
- (18) VALLECITO DAM [USC00058582], Bayfield, CO
- (19) RICO [USC00057017], Cahone, CO
- (20) OURAY #2 [USC00056205], Ouray, CO
- (21) LAKE CITY [USC00054734], Lake City, CO
- (22) CIMARRON [USC00051609], Cimarron, CO
- (23) GUNNISON 3SW [USC00053662], Gunnison, CO
- (24) CRESTED BUTTE [USC00051959], Crested Butte, CO
- (25) TWIN LAKES RESERVOIR [USC00058501], Twin Lakes, CO
- (26) MEREDITH [USC00055507], Basalt, CO
- (27) BONHAM RSVR [USC00050825], Collbran, CO
- (28) ASPEN PITKIN CO AP [USW00093073], Aspen, CO
- (29) EAGLE FAA AP [USW00023063], Gypsum, CO
- (30) GLENWOOD SPGS #2 [USC00053359], Glenwood Springs, CO
- (31) MARVINE RCH [USC00055414], Meeker, CO
- (32) YAMPA [USC00059265], Toponas, CO
- (33) STEAMBOAT SPRINGS [USC00057936], Steamboat Springs, CO

### **Influencing water features**

None

### **Wetland description**

N/A

## Soil features

Composite Description: Soils comprising this site are deep to very deep, well drained soils which occur on uplands, steep fan terrace edges, and side slopes along drainageways. They formed in colluvium or alluvium. Typically the surface is a gravelly, stony, cobbly loam, or sandy loam 4 to 8 inches thick. The subsoil includes gravelly loam and cobbly sandy clay loam over very gravelly, sandy substratums. Permeability is moderate, but runoff and erosion hazard is high due to steep slopes. Available water holding capacity is low due to the large amount of rock fragments in the soil profile. Total rooting depth is 40 to 60 inches or more.

Major soils Associated with this Site:

Loamy Skeletal Soils: Bassel, Ess, Hoodling and Quander

Clayey-Skeletal Soils: Tellura

**Table 4. Representative soil features**

Parent material	(1) Slope alluvium–conglomerate (2) Slope alluvium–sandstone (3) Outwash (4) Colluvium–volcanic rock (5) Colluvium–trachyte (6) Residuum–volcanic rock (7) Slope alluvium–trachyte (8) Colluvium–volcanic breccia (9) Slope alluvium–volcanic breccia
Surface texture	(1) Very gravelly, gravelly, very cobbly loam (2) Very gravelly sandy loam
Family particle size	(1) Loamy-skeletal (2) Clayey-skeletal
Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	40–100 in
Surface fragment cover ≤3"	10–35%
Surface fragment cover >3"	5–20%
Available water capacity (Depth not specified)	1–3 in
Soil reaction (1:1 water) (Depth not specified)	6.1–7.8
Subsurface fragment volume ≤3" (Depth not specified)	15–45%
Subsurface fragment volume >3" (Depth not specified)	5–45%

## Ecological dynamics

The plant community is about 85 percent grass, 10 percent forbs, and 5 percent shrubs air-dry weight.

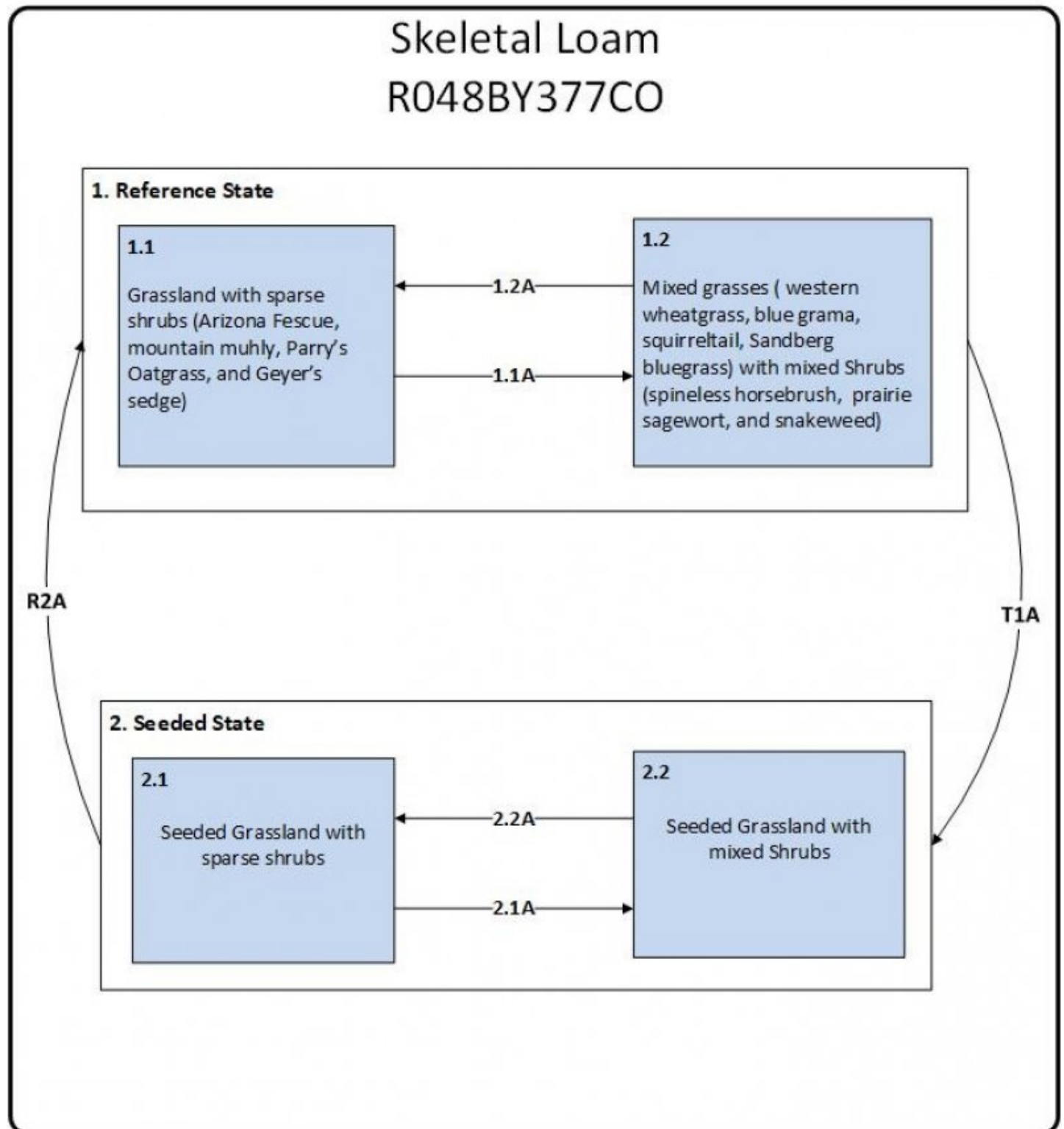
Parry oatgrass and Arizona fescue co-dominate this site with lesser amounts of mountain muhly, elk sedge, prairie Junegrass, Sandberg bluegrass, bottlebrush squirreltail, and western wheatgrass. Minor amounts of blue grama and slimstem muhly are also present.

Major forbs that make up the plant community include northwest cinquefoil, Parry geranium, Pacific Aster, sidebells penstemon, yellow eriogonum, rocky mountain milkvetch, and pingue hymenoxys.



Major shrubs that occur on this site include small (yellow) rabbitbrush, spineless (gray) horsebrush, broom snakeweed, and fringed sagewort.

## State and transition model



# Legend

1.1A, 2.1A – lack of fire, time without disturbance and improper grazing

1.2A, 2.2A – fire, insect herbivory, browsing of shrubs, and/or drought

T1A – Seeding

R2A – natives reestablished over extended time periods

## State 1

### Reference State

If ecological retrogression is cattle induced, desirable grasses and grasslike plants will decrease. Parry's oatgrass, elk sedge, Arizona fescue, Sandberg bluegrass, and mountain muhly are early decreasers under continuous season-long grazing, and will be the first to disappear from the site. With the reduction of more palatable species, prairie Junegrass, blue grama, bottlebrush squirreltail, and slimstem muhly will increase along with fringed sagewort, pingue hymenoxys, northwest cinquefoil, spineless (gray) horsebrush, and small (yellow) rabbitbrush.

## Community 1.1

### Reference State

Basal area (the area of ground surface covered by perennial vegetation measured one-inch above the soil) is approximately 25 percent. Annual Production: If the range is in excellent condition, the approximate total annual production (air-dry) is: Favorable years 1250 lbs/ac Normal years 1000 lbs/ac Unfavorable years 800 lbs/ac Of this production 5 to 10 percent will likely be unpalatable or out of reach of grazing animals.

## Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Grass</b>			680–1063	
	Arizona fescue	FEAR2	<i>Festuca arizonica</i>	136–425	–
	Parry's oatgrass	DAPA2	<i>Danthonia parryi</i>	68–213	–
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	68–213	–
	Geyer's sedge	CAGE2	<i>Carex geyeri</i>	20–64	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	34–53	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–53	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	7–32	–
	muttongrass	POFE	<i>Poa fendleriana</i>	0–21	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	7–21	–
	slimstem muhly	MUF1	<i>Muhlenbergia filiculmis</i>	7–21	–
	pine dropseed	BLTR	<i>Blepharoneuron tricholepis</i>	0–21	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	7–21	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–21	–
<b>Forb</b>					
2	<b>Forbs</b>			80–125	
	sidebells penstemon	PESE11	<i>Penstemon secundiflorus</i>	1–3	–
	slender cinquefoil	POGR9	<i>Potentilla gracilis</i>	1–3	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–3	–
	aspen fleabane	ERSP4	<i>Erigeron speciosus</i>	0–1	–
	pingue rubberweed	HYRI	<i>Hymenoxys richardsonii</i>	0–1	–
	silvery lupine	LUAR3	<i>Lupinus argenteus</i>	0–1	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0–1	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	0–1	–
	Rocky Mountain milkvetch	ASSC7	<i>Astragalus scopulorum</i>	0–1	–
	winged buckwheat	ERAL4	<i>Eriogonum alatum</i>	0–1	–
<b>Shrub/Vine</b>					
3	<b>Shrubs</b>			40–63	
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	1–2	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	1–2	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–1	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–1	–

## Animal community

Native Animal Community Associated with the Potential Plant Community:

This range site provides habitat for a resident animal community that is characterized by small mammals and birds. Southern slopes are especially valuable for winter use by elk and to a lesser degree by antelope.

Livestock Grazing:

This site provides good grazing value for livestock where slopes are less than 20 percent. Grazing is severely restricted on steeper slopes. Continuous, season-long grazing by cattle causes more palatable grasses to be replaced by less desirable grasses like slimstem muhly and bottlebrush squirreltail. A system of grazing which encourages short periods of grazing followed by longer periods of rest is needed to prevent retrogression and loss

of productivity. Deferments occurring in the spring benefit cool-season plants, especially Parry oatgrass and Arizona fescue.

#### Major Poisonous Plants to Livestock:

Plant Common Name/ Livestock Affected/ Type of Poisoning/ Season Serious

Gray Horsebrush/ sheep/ cumulative/ early spring

Rocky Mt. Milkvetch/ all/ cumulative/ spring, summer

Pingue hymenoxys/ sheep/ cumulative/ spring, summer

Silvery lupine/ all/ acute/ other forage scarce

#### Wildlife Values:

Habitat values for small mammals do not significantly change as ecological condition changes. With retrogression induced by cattle grazing, value for elk would decline. The increase of forbs and shrubs would increase wildlife habitat values initially. Retrogression to poor condition will result in massive erosion on steeper slopes, and habitat values will decline severely for all species.

### Hydrological functions

Soils in this site are grouped into "B" hydrologic group, as outlined in the "Soils of Colorado Loss Factors and Erodibility Hydrologic Groupings" handbook. Field investigations are needed to determine hydrologic cover conditions and hydrologic curve numbers. The hydrologic curve number for Group soil is about 61, 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

Very little recreational use is made of this range site. Limited antelope and elk hunting may occur at times. Individuals looking for ecological variation in plant communities due to aspect and moisture patterns would find this site very interesting.

### Wood products

No potential production on this site.

### Other information

Location of Typical Examples of the Site:

- a. Two miles west of Badger Creek up Rye Slough on the North facing slope of the drainageway.
- b. Five miles NE of Guffy located on the Dave Nash Ranch in the NW 1/4 of NE 1/4, Sec. 15, T15S, R72W in Park County.

Endangered Plants and Animals:

No threatened or endangered species of plants or animals have been identified at this time. Species names to be included as reliable information becomes available.

Counties in Which this Range Site Occurs:

Custer

Fremont

Park

### Other references

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## **Contributors**

Suzanne Mayne-Kinney

## **Approval**

Kirt Walstad, 3/05/2024

## **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	04/20/2024
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):**
- 

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:**
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17. **Perennial plant reproductive capability:**
-