

## Ecological site R048AY231CO Dry Mountain 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**

Dry Mountain Loam occur on alluvial fans, valley sides, mountainsides, and terraces. Slopes are less than 30%. Soils are moderately deep to deep (20 to 60+ inches) soils derived from alluvium from sedimentary rock; colluvium from basalt; or colluvium sandstone. Soil surface texture is a loam with fine-loamy subsurface. It is a Wyoming Big

Sagebrush – Needlegrass community. It has an aridic ustic moisture regime and a frigid temperature regime. The effective precipitation ranges from 12 to 16 inches.

### Associated sites

R048AY228CO	<p><b>Mountain Loam</b></p> <p>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.</p>
R048AY237CO	<p><b>Stony Loam</b></p> <p>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>

### Similar sites

R048AY228CO	<p><b>Mountain Loam</b></p> <p>Shallow Loam occurs on mountains, and hills. 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>
R048AY292CO	<p><b>Deep Loam</b></p> <p>Deep Loam occurs alluvial fans, terraces, hills, fan remnants, valley sides, and structural benches. Slopes is between 0 to 25%. Soils are deep (60+ inches) in depth. Soils are derived from alluvium from basalt, or sandstone and shale; colluvium from sandstone and shale; slope alluvium from sandstone and shale or eolian deposits from sandstone and shale. Soil surface texture is loam, sandy clay loam or very channery loam, with a fine-loamy subsurface. It is a mountain big sagebrush – needle-and-thread community. It has an aridic ustic moisture regime and a frigid temperature regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048AY222CO	<p><b>Loamy Park</b></p> <p>Loamy Park occurs on alluvial and colluvial fans, hillsides, plains, sideslopes, terraces, valley sideslopes, and valley bottoms Slopes are from 0 to 30%. Soils are moderately deep to deep (20-60 inches) loamy soils derived from residuum from igneous and metamorphic rocks; alluvium from granite, gneiss, schist, or sandstone and shale. Soil surface texture are sandy loam to loam with loam subsurface. It is a Arizona Fescue – Mountain Muhly community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.</p>
R048AY231CO	<p><b>Dry Mountain Loam</b></p> <p>Dry Mountain Loam occur on alluvial fans, valley sides, mountainsides, and terraces. Slopes are less than 30%. Soils are moderately deep to deep (20 to 60+ inches) soils derived from alluvium from sedimentary rock; colluvium from basalt; or colluvium sandstone. Soil surface texture is a loam with fine-loamy subsurface. It is a Wyoming Big Sagebrush – Needlegrass community. It has an aridic ustic moisture regime and a frigid temperature regime. The effective precipitation ranges from 12 to 16 inches.</p>

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. wyomingensis</i>
Herbaceous	(1) <i>Achnatherum</i> (2) <i>Pseudoroegneria spicata</i>

## Physiographic features

Topography is gently sloping to hilly lands. Slope is usually less than 30%. Elevation ranges from 7500 feet to 9000 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Alluvial fan (2) Valley side (3) Mountainside (4) Fan (5) Terrace
Runoff class	Medium to high
Flooding frequency	None
Ponding frequency	None
Elevation	7,000–9,000 ft
Slope	0–30%
Aspect	W, S, SW

## 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 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 30.7°F to 64.8°F, averaging about 25°F for the winter and 66°F in the summer. Summer high temperatures of mid-80°F to low 80°F are not unusual. The coldest winter temperature recorded was -36°F on February 8, 1933 and the warmest winter temperature recorded was 66°F on February 11, 1962. The coldest summer temperature recorded was 24°F on June 19, 1973 and the warmest was 100°F 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.

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.

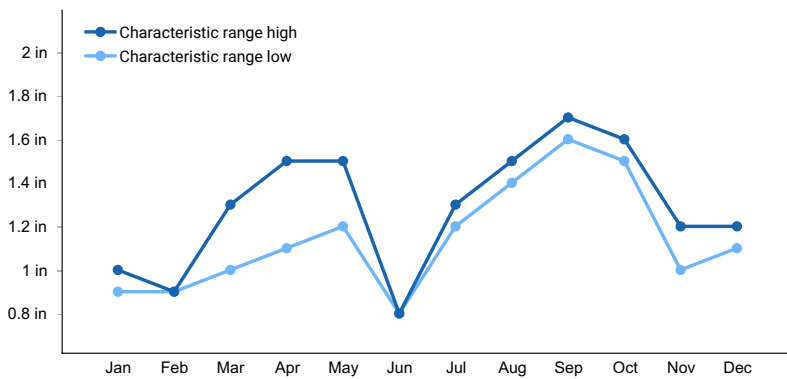
Southwest Volcanics: Lake City, Creede, and Hermit 7 ESE. These high elevation and low precipitation areas are cryic with shorter growing season days of 20 to 70 days per year. Wettest months are August and July. Driest months are December thru February.

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 in this zone are cryic. The growing seasons is 50 to 90 days.

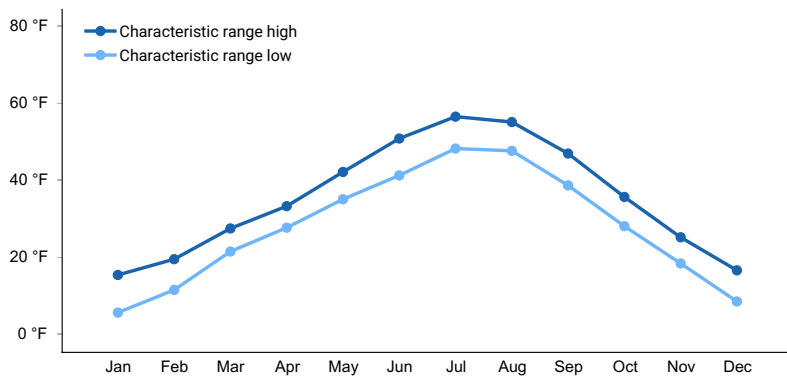
Southeast (Sangre de Cristo Mtns): Westcliffe. Red Wing 1 WSW and Sheep Mountain. The growing season is 90 to 140 days. Driest months are December to February and the wettest are July & August. Frigid.

**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)	14-15 in
Frost-free period (actual range)	46-112 days
Freeze-free period (actual range)	91-142 days
Precipitation total (actual range)	14-15 in
Frost-free period (average)	81 days
Freeze-free period (average)	118 days
Precipitation total (average)	15 in



**Figure 1. Monthly precipitation range**



**Figure 2. Monthly minimum temperature range**

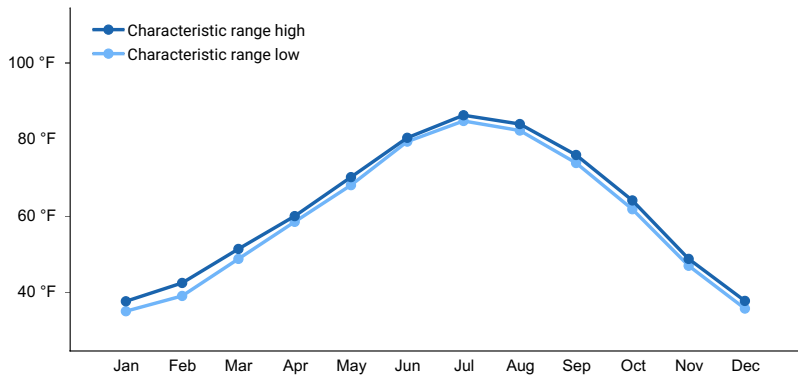


Figure 3. Monthly maximum temperature range

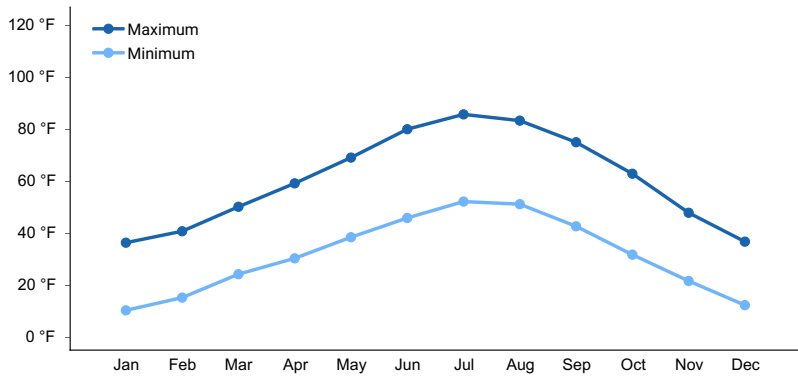


Figure 4. Monthly average minimum and maximum temperature

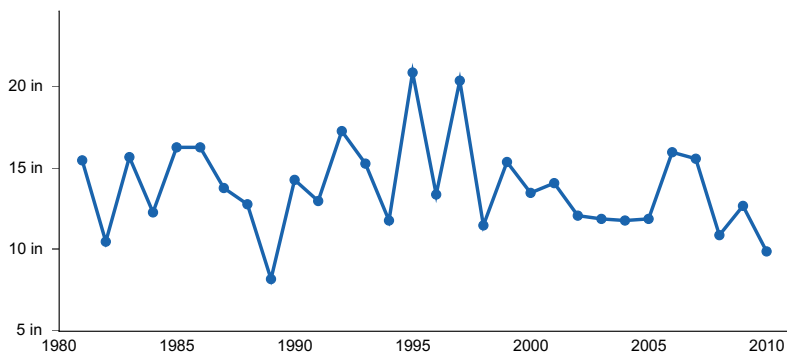


Figure 5. Annual precipitation pattern

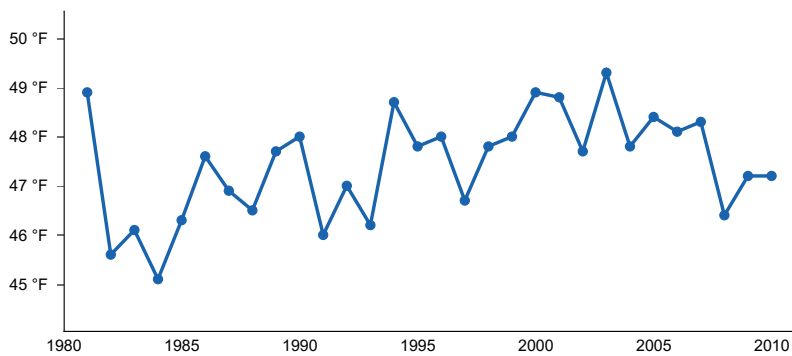


Figure 6. Annual average temperature pattern

### Climate stations used

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

## Influencing water features

There are no water features associated with this site.

## Soil features

Soils in fine-loamy particle size family. Clay content in the profile ranges from 15 to 24% at the soil surface to 18% to 30% clay in the subsurface. Dominate surface texture is a loam.

These soils are examples of the modal concept of this site and not an inclusive list of all the soils where this ecological site can be found.

Forelle, Gelkie, Lymanson, Morset and Woolsey.

This site has been assigned to varying soil properties. Shallow Soils have also been assigned to this ecological site and are not typical of soils on this ecological site. Examples of the shallow soils are Bucklon, Roxal and Teaspoon. These soils are loamy with a loam surface texture and found on mountainsides and ridges. These soils need to have a Ecological Site developed for them in the future.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–sedimentary rock (2) Colluvium–basalt (3) Colluvium–sandstone
Surface texture	(1) Loam
Family particle size	(1) Fine-loamy
Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	20–60 in
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	0–10%
Available water capacity (Depth not specified)	4.7–6.7 in
Calcium carbonate equivalent (Depth not specified)	0–5%
Soil reaction (1:1 water) (Depth not specified)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–20%
Subsurface fragment volume >3" (Depth not specified)	0–10%

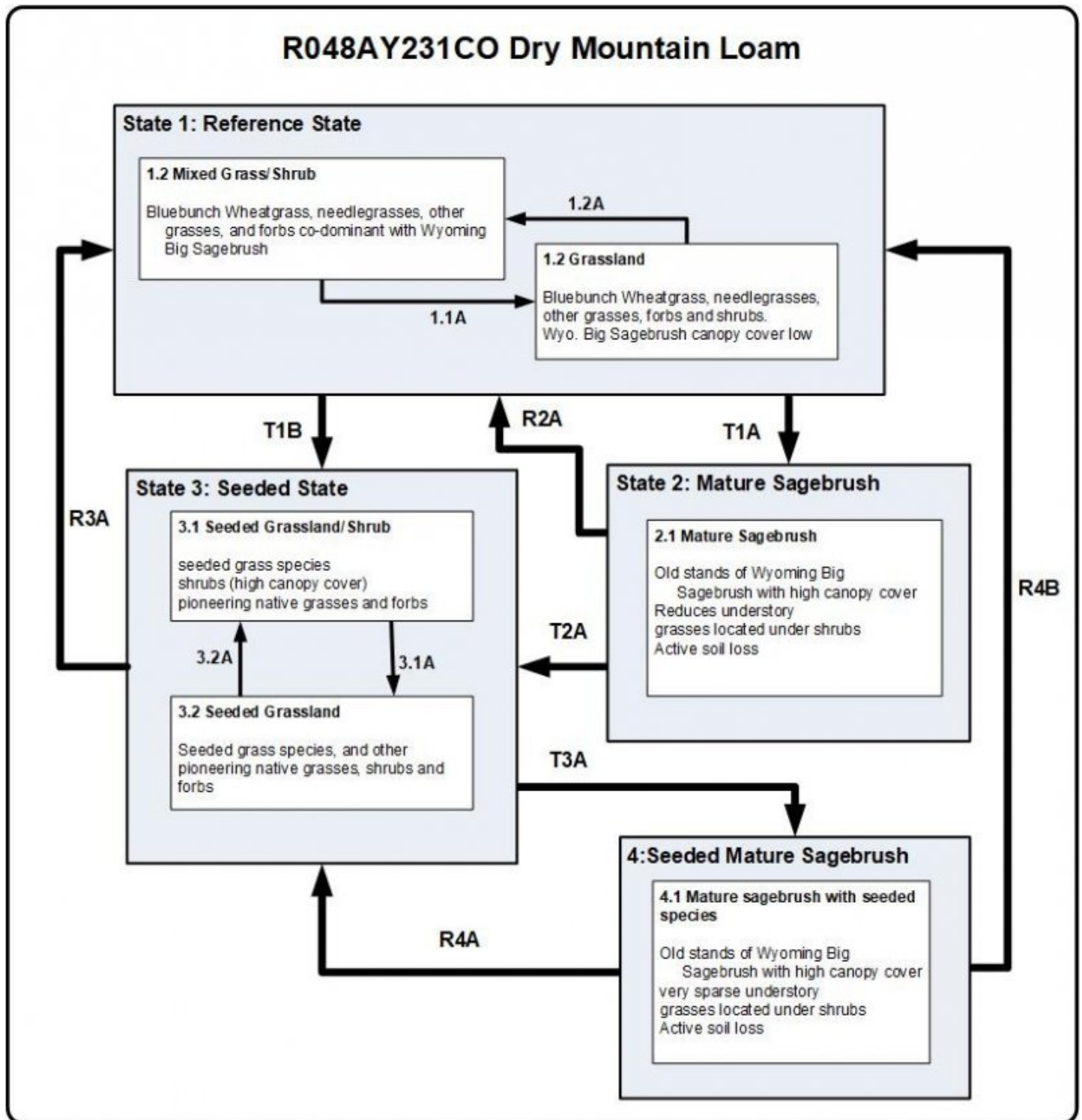
## Ecological dynamics

Bluebunch Wheatgrass usually grows north of the Colorado River and it is replaced functionally and structurally by Indian Ricegrass south of the Colorado River. Sheep Fescue, Pine Needlegrass, Needle and Thread, Praire Junegrass, Bottlebrush Squirreltail, Nevada/Sandberg bluegrass, Muttongrass, and sedges contribute toward a rather sparse grassland appearance.

Sagebrush has a noticeable place on this site. Low rabbitbrush, snowberry, serviceberry, and bitterbrush may be present in small amounts. Low phlox, pussytoes, buckwheat, stonecrop and fringed sage are common.

Optimum ground cover is 35%. The following species are most likely to invade this site: Tall rabbitbrush.

## State and transition model



## Legend

1.2A, 3.2A, T1A, T3A – Extended improper grazing, lack of fire, extended drought, time without disturbance, and/or lack of insect/pathogen outbreaks

1.1A, 3.1A, R4A – Fire, proper grazing, wet climatic cycles, vegetative treatments, and/or small scale insect/pathogen outbreaks

T1B, T2A – Seeded herbaceous species planted and/or shrub removal

R2A – fire, vegetation treatments, insect herbivory, drought, proper grazing, wet climatic cycles, and/or encroached shrub removal

R3A – intensive management and inputs maybe required to return to reference state, wet climatic years, native plantings, vegetative treatments, proper grazing and/or fire



## State 1 Reference State

This site is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing. In some areas especially as you get close to Utah it is possible to graze out Bluebunch Wheatgrass and this functional / structural group gets replaced by Nevada Bluegrass or Sandberg Bluegrass. In areas that have a lot of Nevada or Sandberg Bluegrass, grazing history may have had an influence on these sites. As you go south of I-70, Bluebunch Wheatgrass gets replaced by Indian Ricegrass. In these areas, it doesn't appear that grazing history has a dramatic effect on the wheatgrasses. In some cases grazing helps promote the rhizomatous nature of Western Wheatgrass. This plant community is diverse, stable, and productive. Litter is properly distributed with little movement off-site and natural plant mortality is low. Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Total Annual Production Favorable years: 1000 pounds per acre Median years: 750 pounds per acre Unfavorable years: 500 pounds per acre

## Community 1.1 Reference State

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	420	626	833
Shrub/Vine	75	112	150
Forb	5	12	17
<b>Total</b>	<b>500</b>	<b>750</b>	<b>1000</b>

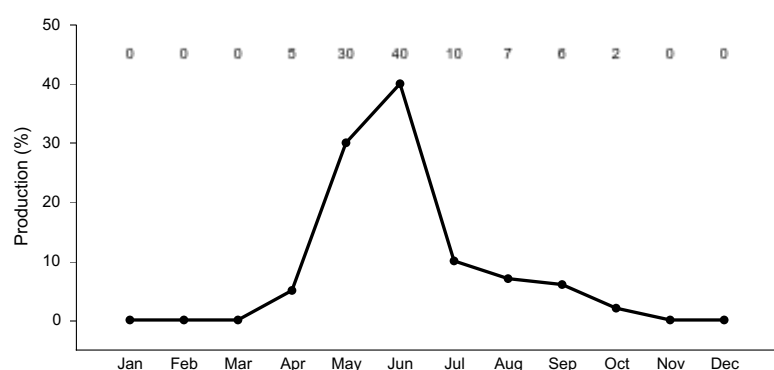


Figure 8. Plant community growth curve (percent production by month). CO0104, MLRA 48A & 34A - Foothill Frigid. MLRA 48A & 34A.

## Additional community tables

Table 6. 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 and grasslikes</b>			420–833	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	200–250	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	200–250	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	0–250	–
	muttongrass	POFE	<i>Poa fendleriana</i>	100–200	–
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	100–200	–
	pine needlegrass	ACPI2	<i>Achnatherum pinetorum</i>	100–200	–
	Arizona fescue	FEAR2	<i>Festuca arizonica</i>	100–200	–

	Sandberg bluegrass	POSE	<i>Poa secunda</i>	125–175	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	110–115	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–100	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	50–100	–
	sheep fescue	FEOV	<i>Festuca ovina</i>	50–100	–
	Geyer's sedge	CAGE2	<i>Carex geyeri</i>	50–100	–
	sedge	CAREX	<i>Carex</i>	50–100	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	50–100	–
<b>Shrub/Vine</b>					
2	<b>Shrubs</b>			75–150	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	110–115	–
	longflower rabbitbrush	CHDE2	<i>Chrysothamnus depressus</i>	50–100	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	50–100	–
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	50–100	–
	black sagebrush	ARNO4	<i>Artemisia nova</i>	50–100	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	50–100	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	50–100	–
	roundleaf snowberry	SYRO	<i>Symphoricarpos rotundifolius</i>	50–100	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	5–25	–
	wax currant	RICE	<i>Ribes cereum</i>	0–10	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	0–5	–
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	0–5	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0–5	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–5	–
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0–5	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–4	–
	creeping barberry	MARE11	<i>Mahonia repens</i>	0–2	–
<b>Forb</b>					
3	<b>Forbs</b>			5–17	
	hollyleaf clover	TRGY	<i>Trifolium gymnocarpon</i>	0–10	–
	bluebells	MERTE	<i>Mertensia</i>	0–10	–
	mat penstemon	PECA4	<i>Penstemon caespitosus</i>	0–10	–
	mountain ball cactus	PESI	<i>Pediocactus simpsonii</i>	0–10	–
	Rocky Mountain penstemon	PEST2	<i>Penstemon strictus</i>	0–10	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–10	–
	longleaf phlox	PHLO2	<i>Phlox longifolia</i>	0–10	–
	hoary tansyaster	MACA2	<i>Machaeranthera canescens</i>	0–10	–
	elegant cinquefoil	POCO13	<i>Potentilla concinna</i>	0–10	–
	woolly cinquefoil	POHI6	<i>Potentilla hippiana</i>	0–10	–
	cinquefoil	POTEN	<i>Potentilla</i>	0–10	–
	yarrow	ACHIL	<i>Achillea</i>	0–10	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–10	–
	aster	ASTER	<i>Aster</i>	0–10	–

aster	ASTER	Aster	0-10	-
balsamroot	BALSA	<i>Balsamorhiza</i>	0-10	-
Wyoming Indian paintbrush	CALI4	<i>Castilleja linariifolia</i>	0-10	-
larkspur	DELPH	<i>Delphinium</i>	0-10	-
fleabane	ERIGE2	<i>Erigeron</i>	0-10	-
buckwheat	ERIOG	<i>Eriogonum</i>	0-10	-
sulphur-flower buckwheat	ERUM	<i>Eriogonum umbellatum</i>	0-10	-
geranium	GERAN	<i>Geranium</i>	0-10	-
lupine	LUPIN	<i>Lupinus</i>	0-10	-
silky lupine	LUSE4	<i>Lupinus sericeus</i>	0-5	-
small-leaf pussytoes	ANPA4	<i>Antennaria parvifolia</i>	0-5	-
prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0-5	-
beautiful cinquefoil	POPU9	<i>Potentilla pulcherrima</i>	0-5	-
clover	TRIFO	<i>Trifolium</i>	0-5	-
shortstyle bluebells	MEBR	<i>Mertensia brevistyla</i>	0-2	-
flaxleaf plainsmustard	SCLI	<i>Schoenocrambe linifolia</i>	0-2	-
scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0-2	-
twinpod	PHYSA2	<i>Physaria</i>	0-2	-
white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0-2	-
Gunnison milkvetch	ASAN4	<i>Astragalus anisus</i>	0-2	-
lesser rushy milkvetch	ASCO12	<i>Astragalus convallarius</i>	0-2	-
onion	ALLIU	<i>Allium</i>	0-2	-
Douglas' dustymaiden	CHDO	<i>Chaenactis douglasii</i>	0-2	-
narrowleaf goosefoot	CHLE4	<i>Chenopodium leptophyllum</i>	0-2	-
daisy	CHRYS2	<i>Chrysanthemum</i>	0-2	-
scrambled eggs	COAU2	<i>Corydalis aurea</i>	0-2	-
bastard toadflax	COUM	<i>Comandra umbellata</i>	0-2	-
widewing springparsley	CYPU	<i>Cymopterus purpurascens</i>	0-2	-
pygmyflower rockjasmine	ANSE4	<i>Androsace septentrionalis</i>	0-2	-
scarlet gilia	IPAG	<i>Ipomopsis aggregata</i>	0-2	-
bladderpod	LESQU	<i>Lesquerella</i>	0-2	-
spearleaf buckwheat	ERLO4	<i>Eriogonum lonchophyllum</i>	0-2	-
redroot buckwheat	ERRA3	<i>Eriogonum racemosum</i>	0-2	-
Navajo fleabane	ERCO27	<i>Erigeron concinnus</i>	0-2	-
Eaton's fleabane	EREA	<i>Erigeron eatonii</i>	0-2	-

## Animal community

### INTERPRETATIONS FOR GRAZING ANIMALS:

This site provides a medium value for cattle, sheep and horses.

### INTERPRETATIONS FOR WILDLIFE:

The site provides a medium value rating for antelope, deer, elk, cottontail, and upland game birds. It provides a low value rating for jackrabbits.

## Hydrological functions

This site provides a medium value for watershed.

## Recreational uses

The site provides a medium value rating for recreation and natural beauty.

## Wood products

No wood products are produced on this site.

## Other products

None

## Other information

### RARE, THREATENED OR ENDANGERED PLANTS AND ANIMALS:

Gunnison sage-grouse

Gunnison prairie dog

Whitetail prairie dog

### FIELD OFFICES

Gunnison, and Montrose.

## Type locality

Location 1: Grand County, CO	
UTM zone	N
UTM northing	386061
UTM easting	4435001
General legal description	North east of Kremmling

## Other references

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## Contributors

Suzanne Mayne-Kinney

## Approval

Kirt Walstad, 3/05/2024

## Acknowledgments

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Those involved in developing earlier versions of this site description include: Bob Rayer, retired NRCS Soil Scientist; Herman Garcia, retired CO State RMS and NRCS MLRA Ecological Site Specialist-QA Phoenix, AZ.

--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)	John Murray, Charlie Holcomb, Lars Santana, Fred Cummings, Alvin Jones, Paul Billig, Steven Jaouen
Contact for lead author	Lars Santana lars.santana@co.usda.gov
Date	12/08/2004
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Slight on slopes less than 10%. Rills can be more defined on slopes ranging from 15-25%, especially following intense storms.

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2. **Presence of water flow patterns:** Slight. Flow paths becoming more apparent on slopes exceeding 15%.

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3. **Number and height of erosional pedestals or terracettes:** Slight. Pedestals may occur on steeper slopes.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect 20-30% bare ground. Extended drought can cause bare ground to increase.

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5. **Number of gullies and erosion associated with gullies:** Occasionally, depending on soil texture, slope steepness and length.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Some wind scouring is possible where surface roughness (rock and/or fragments) is lacking.

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement associated with flow paths. Movement expected to be moderate.

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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):** Stability class rating anticipated to be 3-4 in the interspaces at soil surface.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface texture ranges from a gritty loam to sand loam with a fine granular structure. Depth of the A-horizon is typically 0-4 inches deep, well drained and pale brown in color.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Grasses, forbs, shrub canopy, basal cover and inherent interspaces between plants allow for some overland flow, providing a lost opportunity for infiltration to occur.

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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):** None

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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: Dominants: cool season bunchgrass =

Sub-dominant: shrub (non-sprouter) = forbs > cool season rhizomatous grasses = shrub (sprouter) >

Other: sedges > warm season bunchgrass

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Typically minimal. Expect slight shrub and grass mortality/decadence during and following drought or lack of disturbance.
- 
14. **Average percent litter cover (%) and depth ( in):** 30-50% litter cover at 0.25 inch depth. Litter cover declines during and following extended drought.
- 
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 500 lbs./ac. low precip years; 750 lbs./ac. average precip years; 1000 lbs./ac. above average precip years. After extended drought or the first growing season following wildfire, production may be significantly reduced by 250 – 500 lbs./ac. or more.
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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:** Cheatgrass and noxious weeds.
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17. **Perennial plant reproductive capability:** The only limitations are weather-related, wildfire, natural disease, inter-species competition, wildlife, and insects that may temporarily reduce reproductive capability.
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