

Ecological site R048BY241CO Mountain Meadow

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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): 048B–Southern Rocky Mountain Parks and Valleys

This area is in Colorado (96 percent) and Wyoming (4 percent). It makes up about 2,325 square miles (6,020 square kilometers). The town of Walden, in the northern part of this MLRA, is in a wide valley locally known as North Park. The town of Kremmling is in a valley locally known as Middle Park. The town of Hartsel, in the center of the southern part of the MLRA, is in a broad intermontane basin locally known as South Park. The northern part is bordered by the Medicine Bow, Routt, and Arapaho National Forests, and the southern part is bordered by the San Isabel and Pike National Forests. The Arapaho National Wildlife Refuge is directly south of the town of Walden.

This area is within the Southern Rocky Mountains Province of the Rocky Mountain System. It consists of nearly level to rolling mountain parks and valleys and a few narrow mountain ridges. It occurs as two separate parts in the center of the Southern Rockies. The southern half of the northern part is on the west side of the Continental Divide, and the rest of the MLRA is on the east side of the divide. Elevation ranges from 7,850 to 10,850 feet (2,395 to 3,310 meters). The head waters of North Platte River leaves Colorado and enters Wyoming in the northern half of the northern part of the MLRA (North Park). The headwaters of Colorado River is in the southern half of the northern part of the MLRA (Middle Park). The headwaters of South Platte River is in the southern part of the MLRA (South Park).

The mountain valleys and parks that are characteristic of this MLRA are surrounded by high mountain peaks of the adjacent Southern Rocky Mountains MLRA (48A). Steep slopes give rise to steep-gradient streams that can move cobbles and gravel from the mountain slopes down into the valleys. The coarse textured sediments on the surface of this area were deposited by either glacial meltwater or present-day rivers. Buried deep beneath the sediments is a complex of sedimentary and igneous rocks. Residuum from sedimentary rocks is on the steeper slopes that were not covered by alluvium and glacial outwash.

The average annual precipitation is mainly 10 to 16 inches (255 to 405 millimeters), but it is as high as 28 inches (710 millimeters) at the higher elevations that border the Southern Rocky Mountains MLRA. Precipitation generally increases with elevation. Rainfall occurs as high-intensity, convective thunderstorms during the growing season. About half of the annual precipitation falls as snow. Soil moisture is unevenly distributed within short distances because of snowdrifts. The amount of precipitation is highly influenced by rain shadows. The surrounding peaks receive most of the precipitation as storm systems traverse the area. The average annual temperature is 35 to 42 degrees F (1 to 6 degrees C). The freeze-free period averages 95 days and ranges from 70 to 120 days, decreasing in length with elevation.

The dominant soil order in this MLRA is Mollisols. Alfisols are of lesser extent. The soils are very shallow to deep, generally well drained, and loamy or clayey and have mixed or smectitic mineralogy. The soil temperature regime is dominantly cryic, but it is frigid in some small areas, primarily on south- or west-facing slopes. The soil moisture regime is mainly ustic, but a marginal aridic regime has been identified in areas where the average annual precipitation is less than about 12 inches (305 millimeters). The most extensive great group is Argicryolls (Hodden, Lucky, Parlin, Tiagos, and Cabin series), which commonly formed in outwash and slope alluvium on outwash

terraces, fan remnants, hills, and mountain slopes. Haplocryolls (Redcloud and Tealson series) formed in outwash and slope alluvium on outwash terraces, valley side slopes, hills, and ridges. Haplocryalfs (Gebson and Harsha series) formed in slope alluvium and outwash on outwash terraces, fan remnants, hills, ridges, and mountain slopes. Cryaquolls (Dobrow and Randman series) formed in alluvium on stream terraces and flood plains.

Classification relationships

NRCS:

Major Land Resource Area 48B, Southern Rocky Mountain Parks (United States Department of Agriculture, Natural Resources Conservation Service, 2006).

USFS:

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

EPA:

21i – Sagebrush Parks and 21j – Grassland Parks < 21 Southern Rockies < 6.2 Western Cordillera < 6 Northwestern Forested Mountains North American Deserts (Griffith, 2006).

USGS: Southern Rocky Mountain Province

Ecological site concept

R048BY241CO Mountain Meadow occurs on flood plains, stream terraces, drainageways and alluvial flats. Slopes is between 0 to 5%. Soils are moderately deep to very deep (25 to 100 inches). Soils are derived from alluvium from igneous and metamorphic rock. Soil surface texture is usually loam, fine sandy loam, silty clay loam or sandy clay loam with fine-loamy, fine-loamy over sandy-skeletal or coarse-loamy textured subsurface. It is a tufted hairgrass – Nebraska sedge community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.

Associated sites

R048BY225CO	<p>Mountain Loam 10-16 PZ South Park R048BY225CO Mountain Loam 10-16" South Park occurs fan remnants, pediments and hills. Slopes is between 1 to 25%. Soils are deep to very deep (40 to 80 inches). Soils are derived from alluvium; slope alluvium from volcanic breccia, limestone, sandstone, and/or shale; and outwash from sedimentary rock or granite and gneiss. Soil surface texture is usually loam, sandy loam, gravelly loam or very gravelly sandy loam with either a fine-loamy or loamy-skeletal textured subsurface. It is an Arizona fescue – western wheatgrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 10 to 16 inches.</p>
R048BY296CO	<p>Claypan R048BY296CO Claypan occurs on hills, ridges, alluvial fans and terraces. Slopes is between 0 to 15%. Soils are moderately deep to deep (20 to 60 inches). Soils are derived from alluvium from sedimentary rock; colluvium from sandstone and shale; residuum from shale; or slope alluvium from sandstone and shale. Soil surface texture is usually loam or clay with fine textured subsurface. It is a low (little) sagebrush – western wheatgrass – pine needlegrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048AY230CO	<p>Shallow Loam 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.</p>

R048BY224CO	<p>Dry Salt Playa R048BY224CO Dry Salt Playa occurs drainageways, alluvial flats and playas. Slopes is between 0 to 5%. Soils are deep to very deep (40 to 80 inches). Soils are derived from alluvium. Soil surface texture is usually coarse sandy loam with fine textured subsurface. This soil has gypsum and salt accumulations. It is a seepweed – alkali cordgrass – saltgrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048BY268CO	<p>Dry Flood Plain Step R048BY268CO Dry Flood-Plain Step occurs on flood plain steps in South Park. Slopes is between 0 to 5%. Soils are very deep (60+ inches). Soils are derived from alluvium. Soil surface texture is usually loam or clay loam with fine-loamy over sandy or sandy-skeletal textured subsurface. This site has a strongly contrasting textural stratification at 20 to approximately 30 inches. It is a tufted hairgrass – Nebraska sedge community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048BY221CO	<p>Dry Salt Flat R048BY221CO Dry Salt Flat occurs on flood-plain steps and alluvial flats. Slopes is between 0 to 5%. Soils are deep to very deep (40 to 80 inches). Soils are derived from colluvium or residuum from sandstone. Soil surface texture is usually loam with fine-loamy textured subsurface. It is a winterfat – alkali sacaton – western wheatgrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048BY280CO	<p>Dry Mountain Swale R048BY280CO Dry Mountain Swale occurs on alluvial flat, stream terraces, drainageways, flood plains and flood-plain steps. Slopes is between 0 to 5%. Soils are very deep (60+ inches). Soils are derived from alluvium. Soil surface texture is usually loam, sandy loam or clay loam with fine-loamy, fine-silty or fine textured subsurface. This site receives extra moisture from surrounding uplands that drain into the area. It is a western wheatgrass – slender wheatgrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048BY270CO	<p>Valley Bench R048BY270CO Valley Bench occurs on alluvial fans. Slopes is between 2 to 15%. Soils are moderately deep (20 to 40 inches). Soils are derived from colluvium from sandstone. Soil surface texture is usually sandy loam with fine-loamy textured subsurface. It is a Wyoming big sagebrush – pine needlegrass – prairie Junegrass community. It has an ustic aridic moisture regime. The effective precipitation ranges from 9 to 12 inches.</p>
R048BY272CO	<p>Sandy Bench R048BY272CO Sandy Bench occurs on ridges, hill, dune, terraces, and outwash plains. Slopes is between 10 to 50%. Soils are very deep (60+ inches). Soils are derived from alluvium and eolian sands. Soil surface texture is usually sandy loam or fine sand with sandy or sandy-skeletal textured subsurface. It is a Wyoming big sagebrush – western wheatgrass – upland sedges. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048BY222CO	<p>Loamy Park R048BY222CO Loamy Park occurs on flood plains, flood-plain steps, hills, fans and stream terrace. Slopes is between 0 to 15%. Soils are very deep (60+ inches). Soils are derived from alluvium or colluvium. Soil surface texture is usually loam or sandy loam with fine-loamy textured subsurface. It is an Arizona fescue – mountain muhly community.</p>
R048BY237CO	<p>Stony Loam R048BY237CO Stony Loam occurs on mountain-slopes, ridges, fans and moraines. Slopes is between 20 to 70%. Soils are very deep (60+ inches). Soils are derived from till; colluvium from igneous and metamorphic rock; or residuum from igneous and metamorphic rock. Soil surface texture is usually stony loam, cobbly loam, extremely stony sandy loam, gravelly sandy loam, very gravelly sandy loam, or very cobbly sandy loam with loamy-skeletal textured subsurface. It is a bluebunch wheatgrass – needlegrass community.</p>
R048AY377CO	<p>Skeletal Loam R048BY377CO Skeletal Loam occurs on hills, mountains, mountainsides, fan terraces, pediments, outwash terrace and mesas. Slopes is between 5 to 55%. Soils are deep to very deep (40 to 60+ inches). 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.</p>

Similar sites

R048BY280CO	<p>Dry Mountain Swale R048BY280CO Dry Mountain Swale occurs on alluvial flat, stream terraces, drainageways, flood plains and flood-plain steps. Slopes is between 0 to 5%. Soils are very deep (60+ inches). Soils are derived from alluvium. Soil surface texture is usually loam, sandy loam or clay loam with fine-loamy, fine-silty or fine textured subsurface. This site receives extra moisture from surrounding uplands that drain into the area. It is a western wheatgrass – slender wheatgrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048BY268CO	<p>Dry Flood Plain Step R048BY268CO Dry Flood-Plain Step occurs on flood plain steps in South Park. Slopes is between 0 to 5%. Soils are very deep (60+ inches). Soils are derived from alluvium. Soil surface texture is usually loam or clay loam with fine-loamy over sandy or sandy-skeletal textured subsurface. This site has a strongly contrasting textural stratification at 20 to approximately 30 inches. It is a tufted hairgrass – Nebraska sedge community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.</p>
R048AY241CO	<p>Mountain Meadow 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>
R048AY245CO	<p>Mountain Swale R048AY245CO Mountain Swale occurs flood plains, alluvial fans, swales, stream terraces, and valley floors. Slopes is between 0 to 12%. Soils are deep (60+ inches) in depth. Soils are derived from alluvium. Soil surface texture is loam, with a fine-loamy subsurface. It is a basin wildrye-western wheatgrass community. It receives extra moisture from surrounding uplands that drain into the area. These areas are sloped themselves and drain into perennially wet areas. They have well drained soils and ephemeral streams.</p>
R048AY285CO	<p>Foothill Swale R048AY285CO Foothill Swale - The site occurs in the watershed in areas that receive extra water and fine sediment from surrounding uplands. The soils are deep and loamy in texture with high water-holding capacity. Buried surface horizons and very little rock characterize the soil profile. The soil moisture regime is aridic ustic, and the soil temperature regime is frigid. The aspect of this site is a valley grassland plant community with a rather sparse stand of shrubs. Basin wildrye, western and thickspike wheatgrasses, Indian ricegrass, squirreltail, and Sandburg bluegrass are the dominant grasses. Shrubs include basin big sagebrush, and rubber rabbitbrush.</p>
R048BY265CO	<p>Salt Meadow R048BY265CO Salt Meadow occurs on swales, drainageways. Flood plains, and valley floor. Slopes is between 0 to 5%. Soils are very deep (60+ inches). Soils are derived from alluvium. Soil surface texture is clay loam or silty clay loam with fine textured subsurface. It is a western wheatgrass – saltgrass community. It has an ustic aridic moisture regime. The effective precipitation ranges from 9 to 12 inches.</p>

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Salix</i>
Herbaceous	(1) <i>Deschampsia cespitosa</i> (2) <i>Carex nebrascensis</i>

Physiographic features

The site occurs in on flood plains, stream terraces, drainageways, and alluvial flats. Topography is nearly level to gently sloping. There may be slight irregularities, but the terrain is generally smooth. Slopes are mostly nearly level to 5 percent. Slope has no significant influence on plant growth. Elevation ranges from about 6,600 to 9,300 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream terrace (3) Drainageway (4) Alluvial flat
Runoff class	Very low
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Elevation	2,012–2,835 m
Slope	0–5%
Water table depth	0–61 cm
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation is about 16 to 20 inches. Of this, approximately 60 to 70 percent falls as snow, and 30 to 40 percent falls as rain between middle of June to and the end of September. Summer moisture is mostly from thundershowers in June thru September. October, November, February, and March are the driest periods of the year with the driest month being October. April, May, July, and August is the wettest periods and the wettest month is usually August.

The average annual total snowfall is 137.9 inches. The snow depth usually ranges from one to 24 inches during October thru May. The highest winter snowfall record in this area is 228.80 inches which occurred in 1961-1962. The lowest snowfall record is 57.8 inches during the 1980-1981 winter.

The frost-free period typically ranges from 12 to 65 days. The last spring frost is typically the end of June to the end of July. The first fall frost is usually the end of July to the end of August.

Mean daily annual air temperature ranges from about 20.1 degrees F to 52.9 degrees F, averaging about 18.2 degrees F for the winter and 54.9 degrees F in the summer. Summer high temperatures of low-70 degrees F to mid-70 degrees F are not unusual. The coldest winter temperature recorded was -43 degrees F on January 13, 1963 and the warmest winter temperature recorded was 56 degrees F on February 26, 1950.

The coldest summer temperature recorded was 16 degrees F on June 26, 1978 and the warmest was 92 degrees F on July 15, 1978. Wide yearly and seasonal fluctuations are common for this climatic zone. Data taken from Western Regional Climate Center (2018) for Grand Lake 1 NW, Colorado Climate Station.

This zone in MLRA 48B will need to be broken up into at multiple land resources zones in future projects based on current knowledge of precipitation and temperature patterns based on North Park-Middle Park and South Park. There are only 2 climate stations in this LRU climatic zone and they are both in middle park (Grand Lake 1 NW and Dillion 1 E). Grand Lake is on the high end of precipitation and Dillion is on the lower end.

Table 3. Representative climatic features

Frost-free period (characteristic range)	12-13 days
Freeze-free period (characteristic range)	55 days
Precipitation total (characteristic range)	406-483 mm
Frost-free period (actual range)	12-13 days
Freeze-free period (actual range)	55-65 days
Precipitation total (actual range)	406-508 mm
Frost-free period (average)	13 days
Freeze-free period (average)	55 days

Precipitation total (average)

432 mm

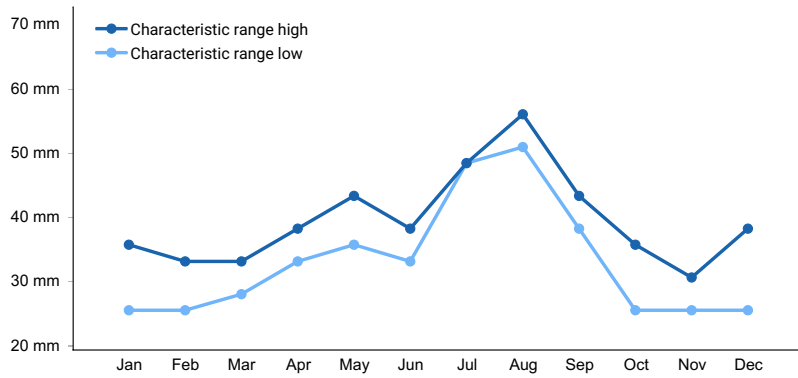


Figure 1. Monthly precipitation range

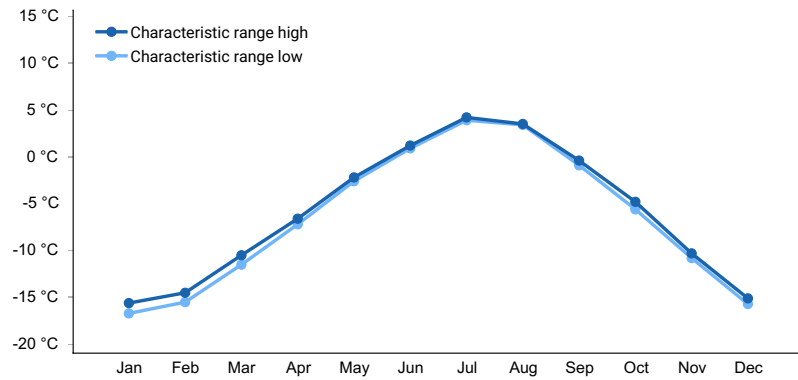


Figure 2. Monthly minimum temperature range

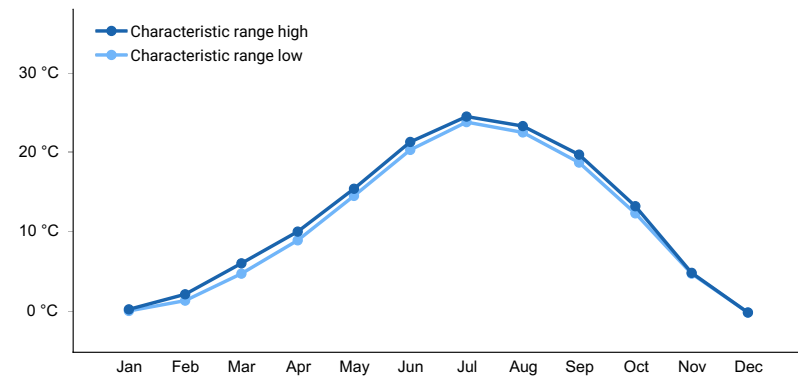


Figure 3. Monthly maximum temperature range

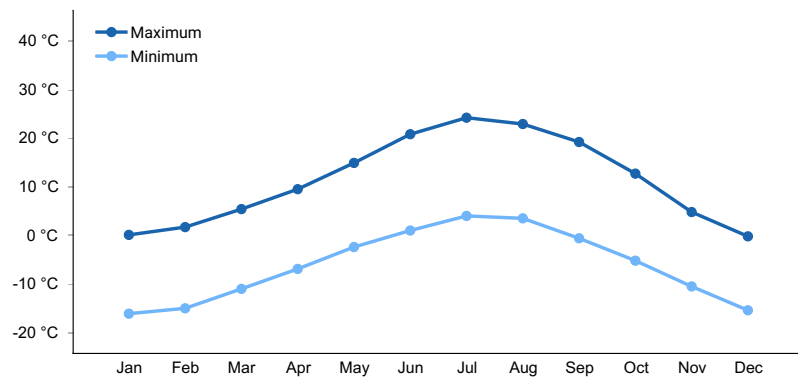


Figure 4. Monthly average minimum and maximum temperature

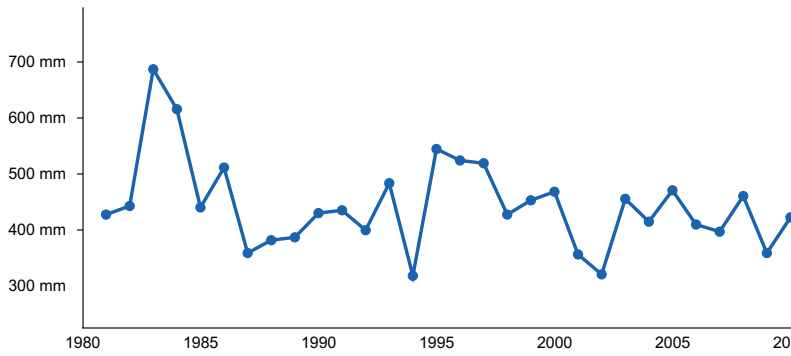


Figure 5. Annual precipitation pattern

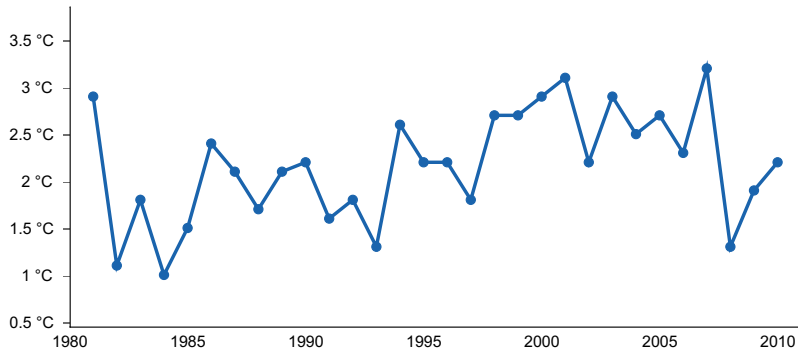


Figure 6. Annual average temperature pattern

Climate stations used

- (1) DILLON 1 E [USC00052281], Dillon, CO
- (2) GRAND LAKE 1 NW [USC00053496], Grand Lake, CO

Influencing water features

This site is associated with an perennial stream that is often sinuous and highly mobile. Mountain meadows act to store and move large quantities of water to streams or rivers. If functioning properly, they can easily dissipate stored energy in the water to reduce erosion and act as a sponge to reduce flooding, especially lower in the watershed. The hydrologic function of mountain meadows are imperative to ensuring the health of both the upland landscape and ecosystems lower in the watershed.

Wetland description

Further details are needed.

Soil features

Soils are moderately deep to very deep, very dark colored, highly organic, poorly to very poorly drained, and typically acid in reaction. They range from sandy loam to clay in texture and include peats and mucks. Loam surface textures are the most common. Peat sometimes can form layers up to 6 inches thick at certain locations. Cobbles are commonly present, but located in the subsurface most of the time. Soil moisture is plentiful throughout the growing season in most years. Soils may become dry on the surface in some spots in late summer and fall or during unusually dry spells; other spots are nearly always wet.

Fine-Loamy Soils:

Giradot

Coarse Loamy Soils:

Dobrow

Table 4. Representative soil features

Parent material	(1) Alluvium (2) Alluvium–igneous and metamorphic rock
Surface texture	(1) Loam (2) Fine sandy loam (3) Silty clay loam (4) Sandy clay loam
Family particle size	(1) Fine-loamy (2) Coarse-loamy
Drainage class	Very poorly drained to poorly drained
Permeability class	Moderately slow to moderately rapid
Soil depth	64–254 cm
Surface fragment cover ≤3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (Depth not specified)	5.08–12.7 cm
Calcium carbonate equivalent (Depth not specified)	0–5%
Electrical conductivity (Depth not specified)	0–4 mmhos/cm
Soil reaction (1:1 water) (Depth not specified)	5.6–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0–35%
Subsurface fragment volume >3" (Depth not specified)	0–20%

Ecological dynamics

Grasses and sedges give the site its characteristic appearance, although a great variety of forbs are showy when in bloom and may comprise up to 20% of the annual yield. Nebraska sedge or other large sedges are dominant on the lowest, usually permanently wet, areas. Tufted hairgrass dominates slightly higher ground, which may be dry on the surface at times. The two types intergrade in many places. Other common grasses or grass-like plants are slender wheatgrass (drier portions), ovalhead sedge, Baltic rush, Canada bluegrass, and bluejoint and northern reedgrasses. Thurber fescue or other fescues may show up on drier portions at higher elevations. Several others can be expected in trace amounts. Some of the prominent forbs are also common to lower meadow sites, native clovers, Rocky Mountain iris, asters, arnicas, groundsels, herbaceous cinquefoils, mints, yarrow, golden pea, vetch, and water hemlock. Some forbs such as ligusticum and fireweed are common on drier mountain sites. But a number of plants typical of this site are primarily, if not entirely, on wet or semi-wet ground in the mountains. Among these are false hellebore, monkshood, elkslip, marsh marigold, saxifrages, sedums, shooting star, primroses, swertia, some gentians, elephant head, bog birch, and shrubby cinquefoil. Willow usually makes up a minor part of the plant community. At some locations there are small amounts of silver sagebrush.

The state and transition model was added to fill the provisional ecological site instruction. It is a very general model.

State and transition model

R048BY241CO Mountain Meadow

State 1: Reference State

1.1 Grass Meadow

Tufted Hairgrass, Nebraska sedge, slender wheatgrass, other grasses other sedges and rushes.

1.1A

1.2 Grass with Mixed Shrubs

Rushes have increased. Nebraska sedge, slender wheatgrass, tufted haorgrass, willows, shrubby cinquefoil. other grasses other sedges and rushes are present.

1.2A

T1A

State 2: Current Potential State

2.1 Grass Meadow

Tufted Hairgrass, Nebraska sedge, slender wheatgrass, other grasses other sedges and rushes. Present of introduced grasses (Kentucky blugrass, timothy, redtop) and forbs.

2.1A

2.2 Grasses with Mixed Shrubs

Kentucky bluegrass, timothy and redtop are dominant. Other grasses, sedges and rushes with willows are present introduced grasses and forbs are present.

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

Tree species are not natural to the site. Approximate ground cover is 70 percent. Species most likely to invade the site are dandelion and introduced forage grasses, especially timothy, red top, and Kentucky bluegrass. Canada thistle is a troublesome invader in some spots. Annual forbs such as owl clover may also come in. As the ecological condition declines, some of the above plants usually become prominent. Several plants natural to the site in small amounts also tend to increase at the expense of most climax grasses. Typical plants in this category are Baltic rush, iris, yarrow, herbaceous cinquefoils, false hellebore, rose, and shrubby cinquefoil. Fescues and silver sagebrush also tend to increase but are not consistently on the site. Shrubby cinquefoil gives the dominant aspect to many deteriorated spots. Sedges on permanently wet spots retain their position much longer than plants on slightly drier spots because of reluctance of livestock to graze in water. Gullies can lower the water table, greatly changing the moisture relationship, on sloping ground. Total annual production Favorable years 4000 pounds/acre air dry Median years 3000 pounds/acre air dry Unfavorable years 2000 pounds/acre air dry

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1614	2270	3026
Forb	314	588	729
Shrub/Vine	314	504	729
Total	2242	3362	4484

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Grasses, sedges, & rushes			1849–2690	
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	897–1121	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	560–785	–
	smallwing sedge	CAMI7	<i>Carex microptera</i>	280–560	–
	sedge	CAREX	<i>Carex</i>	112–224	–
	rush	JUNCU	<i>Juncus</i>	28–84	–
Forb					
2	Forbs			336–841	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	224–448	–
	white false hellebore	VEAL3	<i>Veratrum album</i>	56–168	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	56–168	–
	Rocky Mountain iris	IRMI	<i>Iris missouriensis</i>	56–168	–
	cinquefoil	POTEN	<i>Potentilla</i>	56–168	–
Shrub/Vine					
3	Shrubs			336–673	
	willow	SALIX	<i>Salix</i>	224–448	–
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	112–224	–

Animal community

INTERPRETATIONS FOR LIVESTOCK:

The site provides a high value for grazing by cattle and horses and a medium value for grazing by sheep.

INTERPRETATIONS FOR WILDLIFE

For deer, elk and waterfowl it provides a medium value rating. It provides a low value rating for cottontail and upland game birds. Antelope, bison, and jackrabbits do not use this site. The site provides a high value rating for snowshoe rabbits.

Recreational uses

INTERPRETATIONS FOR RECREATION AND NATURAL BEAUTY:

The site provides a high value rating for recreation and natural beauty

Wood products

Wood products are not produced on this site.

Other information

Rare threatened plants and animals

Orchids such as fairy slipper (calypso) may occur along edges of the site.

This site occurs in the Kremmling, and Walden field offices.

Other references

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Survey, Reston, VA. Scale 1:1,200,000.

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Approval

Kirt Walstad, 9/07/2023

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

Indicators

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

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

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant:

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**
