

Ecological site R048BY222CO Loamy Park

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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

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. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.

Associated sites

R048BY280CO	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.
R048AY377CO	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.
R048BY268CO	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.
R048BY237CO	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. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.

R048AY255CO	Pine Grasslands R048AY255CO Pine Grassland occurs on structural benches, dip slopes, hills, mesas and canyon benches. Slopes is between 0 to 35%. Soils are moderately deep to very deep (20 to 60+ inches). Soils are derived from eolian deposits from sandstone; alluvium, colluvium or slope alluvium from sandstone and shale; or residuum from igneous and metamorphic rock. Soil surface texture is loam, sandy loam or gravelly loam with fine-loamy or fine-silty textured subsurface. It is a Ponderosa Pine – Arizona Fescue community. It has a typic ustic moisture regime and frigid temperature regime. The effective precipitation ranges from 16 to 20 inches.
R048AY218CO	Dry Shallow Pine R048AY218CO Shallow Pine occurs on mountains, hills, and mountainside. Slopes is between 5 to 35%. Soils are shallow (10 to 20 inches) in depth. Soils are derived from slope alluvium from monzonite or gneiss or from residuum from granite, gneiss or granodiorite. Soil surface texture is very gravelly sandy loam with a loamy skeletal subsurface. It is a Gambel's oak – Mountain muhly community. It has an typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.
R048AY230CO	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. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.
R048AY240CO	Shallow Pine 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.

Similar sites

R048BY225CO	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.
R048BY231CO	Dry Mountain Loam R048BY231CO Dry Mountain Loam occurs on alluvial fans, valley sides, mountainsides, fans, terraces, and outwash plains. Slopes is between 0 to 30%. Soils are moderately deep to very deep (20 to 60 inches). Soils are derived from alluvium from sedimentary rock; colluvium from basalt or sandstone; or outwash. Soil surface texture is usually loam or with fine-loamy textured subsurface. It is a Wyoming Big Sagebrush – Needlegrass – Bluebunch Wheatgrass community. It has an aridic ustic moisture regime. The effective precipitation ranges from 12 to 16 inches.
R048BY227CO	Dry Loamy Slopes R048BY227CO Dry Loamy Slopes occurs on fan remnants, pediments, fills, outwash terrace and fan terraces. Slopes is between 3 to 40%. Soils are deep to very deep (40 to 80 inches). Soils are derived from alluvium; slope alluvium from tuff, limestone, sandstone and/or shale; colluvium from tuff; residuum from tuff; or outwash from granite and gneiss or sedimentary rock. Soil surface texture is usually gravelly loam, very cobbly loam or very cobbly sandy loam or sandy loam with fine-loamy or loamy-skeletal textured subsurface. It is a Mountain Muhly – Arizona Fescue community. It has an aridic ustic moisture regime. The effective precipitation ranges from 10 to 16 inches.

R048AY228CO	Mountain Loam R048AY228CO 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.
R048AY222CO	Loamy Park R048AY222CO 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 an Arizona Fescue – Mountain Muhly community. It has a typic ustic moisture regime. The effective precipitation ranges from 16 to 20 inches.
R048AY292CO	Deep Loam R048AY292CO 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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Festuca arizonica</i> (2) <i>Muhlenbergia montana</i>

Physiographic features

This site occurs on fans, hills, flood plains, flood-plain steps, and stream terraces. Slopes are usually from 0 to 15%, but can range up to 30%. Elevation ranges from 8600 to 9500 feet. Elevation limits depend to some extent on exposure but principally on storm patterns and air movement.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Flood-plain step (3) Hill (4) Fan (5) Stream terrace
Runoff class	Low to medium
Flooding frequency	None
Ponding frequency	None
Elevation	2,621–2,896 m
Slope	0–15%
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 and November and February and March are the driest periods of

the year with the driest month being October. April and May, and 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 1 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°F to 52.9°F, averaging about 18.2°F for the winter and 54.9°F in the summer. Summer high temperatures of low-70°F to mid-70°F are not unusual. The coldest winter temperature recorded was -43°F on January 13, 1963 and the warmest winter temperature recorded was 56°F on February 26, 1950. The coldest summer temperature recorded was 16°F on June 26, 1978 and the warmest was 92°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

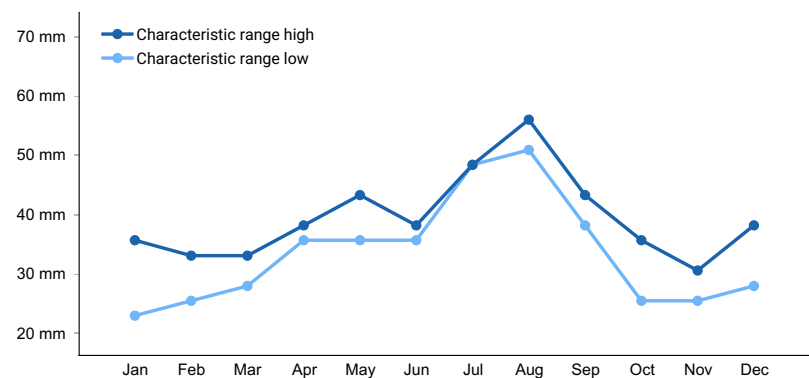


Figure 1. Monthly precipitation range

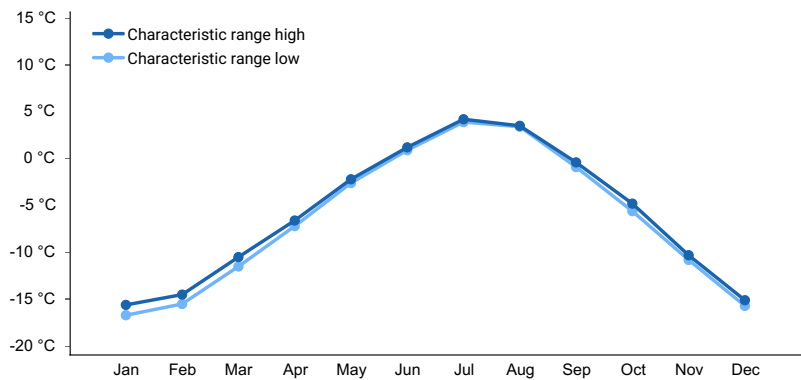


Figure 2. Monthly minimum temperature range

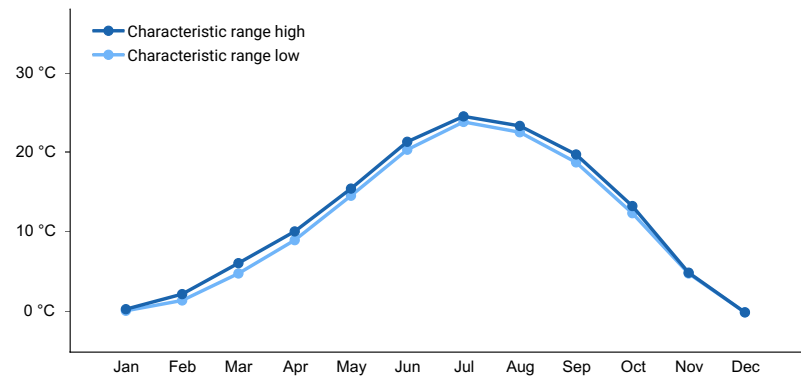


Figure 3. Monthly maximum temperature range

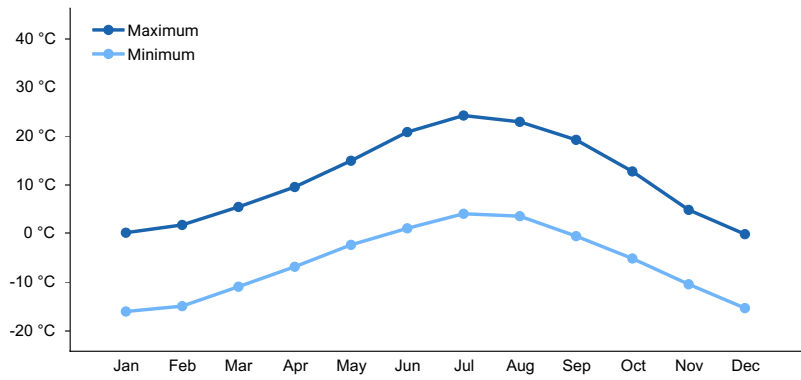


Figure 4. Monthly average minimum and maximum temperature

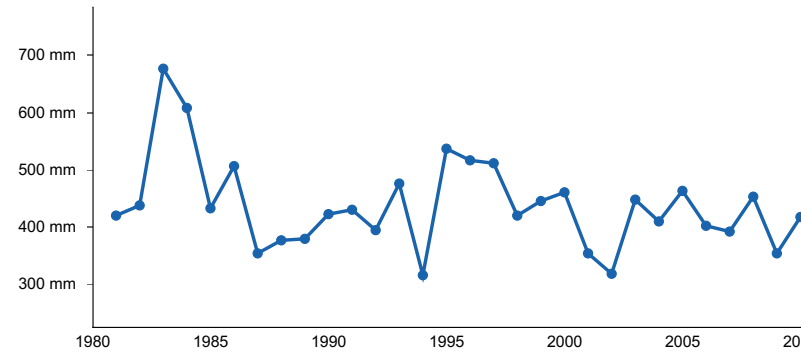


Figure 5. Annual precipitation pattern

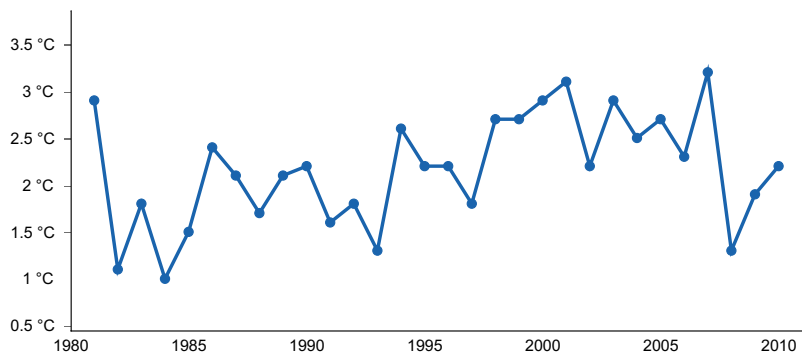


Figure 6. Annual average temperature pattern

Climate stations used

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

Influencing water features

None are present on this site.

Soil features

The soils in this site are moderately deep to very deep and well drained. The underlying layers are fine-loamy textured and some contain gravel and cobbles. Roots penetrate the soil readily down to bedrock.

They are formed from colluvium, alluvium, and colluvium.

Fine-loamy particle control section soils associated with this site are:

Adderton and Youga

Table 4. Representative soil features

Parent material	(1) Alluvium (2) Colluvium
Surface texture	(1) Loam (2) Sandy loam
Family particle size	(1) Fine-loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	152 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (Depth not specified)	10.16–16.51 cm
Soil reaction (1:1 water) (Depth not specified)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	10–25%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

The native plant community is about 80 percent (air-dry weight) grasses, 10 to 15 percent forbs, and 3 to 5 percent shrubs. Three major bunchgrasses dominate the plant community: Arizona fescue, mountain muhly, and Parry oatgrass. These three comprise 75 percent of the total annual production of the site. Grasses making up lesser percentages are western wheatgrass, slender wheatgrass, bearded wheatgrass, prairie Junegrass, needleandthread, Columbia needlegrass, Letterman needlegrass, and nodding brome. Mountain big sagebrush is found mostly on the western slope of Colorado.

A small amount of other grasses, a variety of forbs, and a few shrubs comprise the rest of the annual production. Trees are normally absent from the native plant community. An occasional white fir, ponderosa pine, Engelmann spruce, subalpine fir, lodgepole pine, and aspen may invade the site from adjacent woodland.

If ecological retrogression is cattle induced, desirable grasses will decrease. However, if retrogression is sheep induced, desirable forbs and shrubs may be reduced. Deterioration of the site will decrease Parry oatgrass, mountain muhly, Arizona fescue, the wheatgrasses, and the bromes.

Deterioration of the site will initially increase western wheatgrass, prairie Junegrass, elk and sun sedge, Letterman needlegrass, and most of the forbs and shrubs but with continuous heavy grazing, even these grasses will disappear.

With severe depletion plant species likely to invade or increase on this site and become a part of the plant community are annual forbs, curlycup gumweed, sleepy grass, flannel mullein, cheatgrass, and gamble oak, slimstem muhly and blue grama. On the western slope mountain big sagebrush will increase.

Annual production

Favorable years 2000 lbs/ac 2268 kg/ha

Normal years 1500 lbs/ac 1701 kg/ha

Unfavorable years 800 lbs/ac 907 kg/ha

Of this production, 15 to 20 percent is likely to be unpalatable to grazing animals.

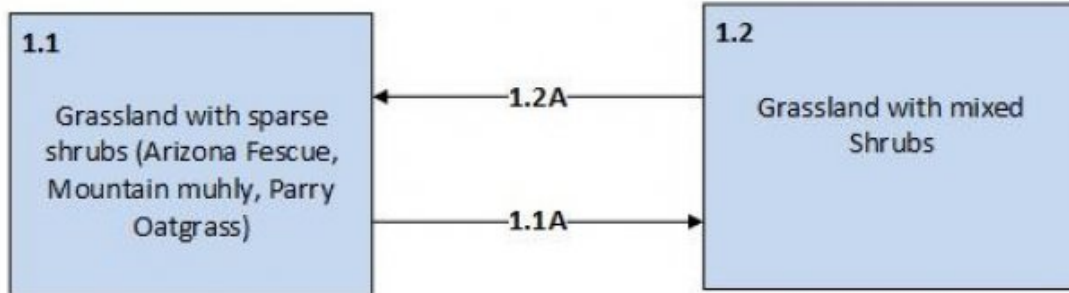
State and Transition Models are very basic and created for the Provisional Ecological Site Instruction.

State and transition model

Loamy Park

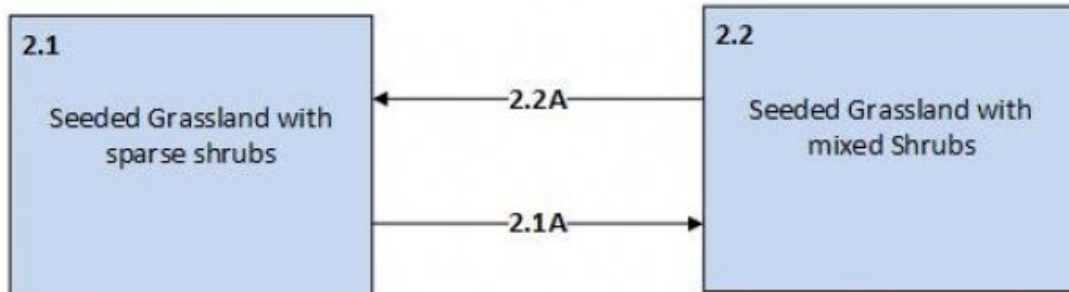
R048BY222CO

1. Reference State



R2A

2. Seeded State



T1A

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

Community 1.1

Reference State

The native plant community is about 80 percent (air-dry weight) grasses, 10-15 percent forbs, and 3 to 5 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	572	1255	1726
Forb	163	213	258
Shrub/Vine	163	213	258
Total	898	1681	2242

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			510–622	
	Parry's oatgrass	DAPA2	<i>Danthonia parryi</i>	420–588	–
	Arizona fescue	FEAR2	<i>Festuca arizonica</i>	420–588	–
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	420–588	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	84–168	–
	pine dropseed	BLTR	<i>Blepharoneuron tricholepis</i>	0–118	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–84	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–84	–
	nodding brome	BRAN	<i>Bromus anomalus</i>	34–84	–
	mountain brome	BRMA4	<i>Bromus marginatus</i>	17–84	–

	Letterman's needlegrass	ACLE9	<i>Achnatherum lettermanii</i>	34–84	–
	slender wheatgrass	ELTRS	<i>Elymus trachycaulus</i> ssp. <i>subsecundus</i>	0–84	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–67	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–67	–
	muttongrass	POFE	<i>Poa fendleriana</i>	0–50	–
	elk sedge	CAGA3	<i>Carex garberi</i>	0–34	–
	sun sedge	CAINH2	<i>Carex inops</i> ssp. <i>heliophila</i>	0–34	–
	squirreldail	ELEL5	<i>Elymus elymoides</i>	0–17	–
	slimstem muhly	MUFI	<i>Muhlenbergia filiculmis</i>	0–17	–

Forb

2	forbs			168–252	
	Drummond's milkvetch	ASDR3	<i>Astragalus drummondii</i>	17–34	–
	Missouri milkvetch	ASMI10	<i>Astragalus missouriensis</i>	17–34	–
	prairie thermopsis	THRH	<i>Thermopsis rhombifolia</i>	17–34	–
	American vetch	VIAM	<i>Vicia americana</i>	17–34	–
	sego lily	CANU3	<i>Calochortus nuttallii</i>	17–34	–
	Fremont's geranium	GECAF	<i>Geranium caespitosum</i> var. <i>fremontii</i>	17–34	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	0–17	–
	scarlet gilia	IPAG	<i>Ipomopsis aggregata</i>	0–17	–
	silvery lupine	LUAR3	<i>Lupinus argenteus</i>	0–17	–
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	0–17	–
	Torrey's penstemon	PEBAT	<i>Penstemon barbatus</i> ssp. <i>torreyi</i>	0–17	–
	sidebells penstemon	PESE11	<i>Penstemon secundiflorus</i>	0–17	–
	Rocky Mountain penstemon	PEST2	<i>Penstemon strictus</i>	0–17	–
	eastern pasqueflower	PUPA5	<i>Pulsatilla patens</i>	0–17	–
	lambsquarters	CHAL7	<i>Chenopodium album</i>	0–17	–
	trailing fleabane	ERFL	<i>Erigeron flagellaris</i>	0–17	–
	streamside fleabane	ERGLP	<i>Erigeron glabellus</i> var. <i>pubescens</i>	0–17	–
	redroot buckwheat	ERRA3	<i>Eriogonum racemosum</i>	0–17	–
	western yarrow	ACMIO	<i>Achillea millefolium</i> var. <i>occidentalis</i>	0–17	–
	nodding onion	ALCE2	<i>Allium cernuum</i>	0–17	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0–17	–
	Fendler's sandwort	ARFE3	<i>Arenaria fendleri</i>	0–17	–
	Lyall's rockcress	ARLY	<i>Arabis lyallii</i>	0–17	–
	Wyoming Indian paintbrush	CALI4	<i>Castilleja linariifolia</i>	0–17	–

Shrub/Vine

3	shrubs			168–252	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	0–84	–
	Gambel oak	QUGA	<i>Quercus gambelii</i>	0–84	–
	Parry's rabbitbrush	ERPAH	<i>Ericameria parryi</i> var. <i>howardii</i>	17–50	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	17–50	–

	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0–50	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	17–34	–
	wax currant	RICE	<i>Ribes cereum</i>	17–34	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	17–34	–
	Fendler's ceanothus	CEFE	<i>Ceanothus fendleri</i>	0–17	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–17	–
	green rabbitbrush	ERTE18	<i>Ericameria teretifolia</i>	0–17	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–17	–

Animal community

INTERPRETATIONS FOR GRAZING ANIMALS:

This site provides excellent spring and summer forage for cattle, horses, sheep, elk, deer, and small mammals.

The animal forage preference changes as the spring season progresses into summer, fall, and winter. All of the dominant grasses on this site are most desirable in the spring and early summer. Good management on this site necessitates that proper grazing use and planned deferment be followed so that these grasses are not grazed out and replaced by less desirable species.

Vegetation palatability will influence proper grazing use considerations. Relative palatability for each species will vary depending on the season of use, kind of grazing animal, past grazing use, and the associated plant species.

INTERPRETATIONS FOR WILDLIFE:

This site has a high potential for wildlife habitat because of the great variety and abundance of desirable grasses and forbs produced. This site provides habitat for elk, mule deer, nongame birds, coyote, and small mammals.

Hydrological functions

The soils in this site are grouped into “B” and “C” hydrologic groups, as outlined in the “Soils of Colorado Loss Factors and Erodibility Hydrologic Groupings 1979,” handbook. Field investigations are needed to determine hydrologic cover conditions and hydrologic curve numbers. The hydrologic curve numbers for group “B” and group “C” soils are 61 and 74 respectively, when hydrologic conditions are good, as shown in “Peak Flows in Colorado” handbook.

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

Recreational uses

This site has many forbs and some shrubs that bloom from early spring to early summer, which are aesthetically pleasing. Hunting for mule deer and Elk is generally good to excellent on this site.

Wood products

No wood products are produced on this site.

Other information

THREATENED AND ENDANGERED PLANTS AND ANIMALS

Gaura neomexicana coloradoensis or Colorado Butterfly weed has been reported as endangered and has been reported in Douglas, Weld, and Larimer counties. However, its occurrence on this range site had not been proven.

POISONOUS PLANTS:

Gamble oak can be poisonous to cattle and sheep in early spring during budding and leafing and after a frost. As leaves mature, toxicity decreases.

Gray Horsebrush (*Tetradymia canescens*) can be poisonous to sheep in early spring when sheep graze the buds. Symptoms may vary but can include depression, weakness, and sometimes death within a few hours. In many cases, acute illness is followed by sensitiveness and irritation about the head, followed by swelling of the head (bighead), neck, ears, eyelids, and nose. This is especially common in sheep that have been exposed to sunlight. One kg (2.2 pounds) a day for two days or ½ of 1% of the animals weight in early spring is fatal to sheep. The poison is cumulative.

Nuttall larkspur (*Delphinium nuttallianum*) can be poisonous to cattle, horses, and rarely sheep in spring and early summer when other green forage is not available. Poisoning is cumulative. Symptoms include loss of appetite, salivation, muscular twitching, general uneasiness, and staggering gait. In advanced cases the animal falls and lies with feet extended more or less rigidly. Poisoned animals are constipated and severe cases are nauseated and bloating may occur.

Pingue Hymenoxys (*Hymenoxys richardsonii*) is mainly poisonous to sheep but occasionally cattle. It is poisonous through the growing season. Hungry animals are very susceptible in the spring and fall. All above ground parts of pinque hymenoxys are poisonous. Grazing the plant may cause a gradual build up of the toxin to a lethal level, or if large amounts are eaten, poisoning may occur immediately. The first sign of poisoning is green froth around the nose and mouth from salivation and vomiting. Other signs are loss of appetite, weakness, and depression, irregular gait and trembling, followed by emaciation and death unless animals are removed from the area.

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

Lupinus sericeus will cause crooked leg disease in calves during the 40th to 70th day of gestation and will cause other congenital deformities. The most characteristic symptom is labored breathing. Animals may vary from depression and coma to extreme activity. Animals may butt objects and other animals or may stand with lowered head pressing against a solid object. Death from respiratory paralysis follows a short period of convulsions.

Poisoning of cattle show dry nose, stilted walk, lethargy, depression, hard dry feces, rough dry hair, coat, quivering, extreme body weakness, irregular exaggerates these symptoms.

Broom snakeweed (*Xanthocephalum sarothrae*) is poisonous to cattle and sheep when forage is scarce. Poisoning is not common but will occur on overgrazed ranges. Causes abortion in cattle or may produce weak, underweight calves. Losses are sporadic and will occur when 10-20 percent of the body weight of green material is consumed in ½ to 20 weeks.

Lambert crazyweed (*Oxytropis lambertii*) is poisonous to all animals in all season but especially spring. Poisoning is cumulative. Signs of poisoning appear after 2 to 3 weeks of continuous grazing. With acute poisoning in cows and ewes, abortion and congenital skeletal malformations frequently occur. Animals must eat large amounts for 2 to 5 weeks before death occurs. Constipation, incoordination of muscles and peculiar gait, crazed actions, loss of flesh, loss of sense of direction, and nervousness are the visible signs.

The site occurs in the Canon City, Castle Rock, Center, Colorado Springs, Cortez, Cripple Creek, Durango, Fort Collins, La Jara, Lakewood, Longmont, Monte Vista, Pagosa Springs, Pueblo, Salida, San Luis, Trinidad, Walsenburg, and Westcliffe field offices.

Type locality

Location 1: Chaffee County, CO	
General legal description	The open park east of highway 285 on Trout Creek Pass.

Other references

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Approval

Kirt Walstad, 9/07/2023

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	05/11/2025
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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