

Ecological site R043BY003ID**Loamy
22+ PZ
FEID-PSSPS**

Last updated: 2/03/2020

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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): 043B–Central Rocky Mountains

Major Land Resource Area (MLRA): 043B–Central Rocky Mountains Major Land Resource Area (MLRA): 43B – Central Rocky Mountains – This MLRA is extensive including Montana, Idaho, Wyoming and a small portion in Utah. MLRA 43B includes the Rocky Mountains. A revision of the MLRA's in 2006 lead to the inclusion of the foothills with the mountains for much of Wyoming. Cartographic standards limited the ability to capture the foothills as a separate MLRA . Further information regarding MLRAs, refer to: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Available electronically at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook.

Classification relationships

Hierarchical Classification Relationships Relationship to Other Established Classification Systems: National Vegetation Classification System (NVC): 2 Shrub & Herb Vegetation 2.B Temperate & Boreal Grassland & Shrubland 2.B.2 Temperate Grassland & Shrubland 2.B.2.Na Western North American Grassland & Shrubland M048 Central Rocky Mountain Montane-Foothill Grassland & Shrubland A3965 Central Rocky Mountain Subalpine Dry Idaho Fescue Grassland CEG001611 – Festuca idahoensis – Carex obtusata Grassland or CEG001612 – Festuca idahoensis – Danthonia intermedia Grassland or CEG001899 – Festuca idahoensis – Carex scirpoidea Grassland

Ecological site concept

- Site receives no additional water.
- Slope is 20%
- Soils are:
 - o Derived from sedimentary parent materials.
 - o Textures range from very fine sandy loam to clay loam in top 4" (10 cm) of mineral soil surface
 - o Clay content is or = 32% in top 4" (10 cm) of mineral soil surface
 - o Each following subsurface horizon has a clay content of 35% by weighted average in the particle size control section
 - o Moderately deep to very deep (20-78+ in. (50-200+ cm)
 - o 3% stone and boulder cover and 20% cobble and gravel cover
 - o Not skeletal (35% rock fragments) within 20" (51 cm) of mineral soil surface
 - o None to Slightly effervescent throughout top 20" (51 cm) of mineral soil surface
- Non-saline, sodic, or saline-sodic

Associated sites

R043BY002ID	Granitic 22+ PZ ARTRV/FEID
R043BY004ID	Shallow Fractured Stony Loam 16-22 PZ ARTRV/FEID
R043BY009ID	Loamy 16-22 PZ ARTRV/FEID

R043BY017ID	Shallow Stony 22+ PZ ARTRV/FEID
R043BY018ID	South Slope Stony 22+ PZ PSSP6-FEID
R043BY019ID	North Slope Loamy 16-22 PZ SYORU/FEID-PSSPS
R043BY020ID	South Slope Gravelly 16-22 PZ ARTRV/BRMA4-ELTRT
R043BY022ID	Windswept Mountain Ridge 22+ PZ FEID-CAREX

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping foothills and mountains with slopes ranging from 3 to 30 percent. Elevations range from 4000 to 6000 feet (1200-1850 meters).

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Fan remnant
Elevation	1,220 – 1,830 m
Slope	0 – 30 %
Water table depth	100 – 150 cm
Aspect	Aspect is not a significant factor

Climatic features

The Central Rocky Mountains range in elevation from 6000 to 10000 feet above sea level with some peaks reaching over 12000 feet. The average annual precipitation, based on 10 long term climate stations located throughout the MLRA , is 21 inches. The annual average

minimum is 18 and the annual average maximum recorded is 24 inches. The annual average temperature is 41.7 degrees Fahrenheit. The annual average low is 26.7 and the annual average high is 56.7 degrees F. The frost free period ranges from 58 to 80 days while the freeze free period ranges from 90 to 116 days.

Table 3 Representative climatic features

Frost-free period (average)	80 days
Freeze-free period (average)	120 days
Precipitation total (average)	610 mm

Influencing water features

This site is not influenced by adjacent wetlands, streams, or run on.

Soil features

The soils on this site are generally deep loam to clay loam formed alluvium and residuum mainly from basalt. They are moderately well to well drained. Permeability is moderate to moderately slow, available water capacity is low to moderate and the hazard of erosion is slight to moderate. Reaction of the surface layers ranges from slightly acid to neutral. A water table may occur at depths of 3 to 6 feet in spring to mid-summer; however, this is generally below the rooting depth of most plants. These soils are characterized by xeric moisture and mesic to frigid temperature regimes.

Soil Series Correlated to this Ecological Site

Suddith variant
Sudpeak
Appldallia

Table 4. Representative soil features

Surface texture	(1) Loam
Drainage class	Well drained to moderately well drained
Permeability class	Moderate to moderately slow
Soil depth	150 – 0 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	0 – 10 %

Available water capacity (0-101.6cm)	9.65 – 19.3 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	0 – 30 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

Ecological dynamics

The dominant visual aspect of this site is grassland with Idaho fescue, bluebunch wheatgrass, and slender wheatgrass as the dominant species. Composition by weight is approximately 70 to 80 percent grasses, 15 to 25 percent forbs, and 5 percent shrubs.

During the last few thousand years, this site has evolved in a cool climate characterized by dry summers and cold, moist winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer, Rocky Mountain elk, and lagomorphs.

Fire has historically occurred on the site at intervals of 20 - 40 years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by Idaho fescue, bluebunch wheatgrass, and slender wheatgrass. Mountain brome, prairie junegrass, tapertip hawksbeard, and lupine are prevalent. There are a variety of other grasses and forbs that occur in minor amounts. A few shrubs are present that include Woods' rose, mountain snowberry, rabbitbrush, and currant. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 2400 pounds per acre (2688 kilograms per hectare) in a normal year. Production in a favorable year is 3200 pounds per acre (3584 kilograms per hectare). Production in an unfavorable year is 1500 pounds per acre (1680 kilograms per hectare). Structurally, cool season deep-rooted perennial bunchgrasses are more dominant than forbs followed by shrubs.

FUNCTION:

Big game animals use the site in the late spring, summer, and fall. Livestock use is best in the summer and fall. The site has some

aesthetic and hunting value.

The site is resistant to degradation due to high production, but can be degraded with improper grazing management.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency and ungulate grazing, Idaho fescue and bluebunch wheatgrass can become decadent. This is apparent by dead centers in the crowns. Forbs will be maintained in the community.

When fires become more frequent than historic levels (20-40 years), Idaho fescue and bluebunch wheatgrass can be reduced in the plant community. With continued short fire frequency, these species can be completely eliminated along with some forbs. These species may be replaced by a variety of annual and perennial forbs including noxious and invasive species. These fine fuels will cause fires to become more frequent. Kentucky bluegrass may also invade the site. Rabbitbrush, Woods' rose, and mountain snowberry will usually be maintained in the plant community due to sprouting.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. This type of management leads to reduced vigor of the bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, an increase in mountain brome can occur and noxious and invasive plants will invade. Kentucky bluegrass may also invade the site. Forbs will increase. Continued improper grazing management influences fire frequency by increasing fine fuels. As annuals increase, fires become more frequent.

Proper grazing management that addresses frequency, duration, and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Careful planning needs to occur prior to conducting prescribed burns on this site.

Weather influences:

Above normal precipitation in May and June can dramatically increase total annual production of the plant community. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Likewise, below normal precipitation during these spring months can significantly reduce total annual production and be detrimental to viable seed production. Overall plant composition is normally not affected when perennials have good vigor.

An early, hard freeze can occasionally kill some plants. Prolonged drought adversely affects this plant community in several ways. Vigor, recruitment, and production are usually reduced. Mortality can occur. Prolonged drought can lead to a reduction in fire frequency.

Influence of Insects and disease:

Outbreaks can affect vegetation health. Grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Annual and perennial invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

Big game animals will use this site in the late summer, summer, and fall. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff occur with a decrease in perennial bunchgrasses. This composition change can affect nutrient and water cycles. Increased runoff also causes sheet and rill erosion. Abnormally short fire frequency also gives the same results, but to a lesser degree. The long-term effect is a transition to a different state.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.

Phase A to B. Develops with improper grazing management and no fire.

Phase A to C. Develops with fire.
 Phase B to A. Develops with prescribed grazing.
 Phase C to A. Develops with prescribed grazing and no fire.

State 1, Phase B or Phase C to State 2. Develops through frequent fire and/or continued improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

State 2 to State 3. Develops through rangeland seeding.

State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fire cause this state to cross a threshold and retrogress to a new site with reduced potential. It is economically impractical to return this plant community to State 1 with accelerating practices.

Practice Limitations:

Slight limitations exist on this site for accelerated, facilitating and vegetation management practices.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 6.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

Animal Community – Wildlife Interpretations This rangeland ecological site provides diverse habitat for native wildlife species. The plant community exhibits a diverse mixture of forbs throughout the growing season offering excellent habitat for invertebrates. Mule deer and elk may utilize the site in the spring, summer, and fall. The rangeland provides seasonal habitat for resident and migratory animals including western toad, shrews, bats, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk, and prairie falcon. Area sensitive species include Merriam's shrew, Idaho pocket gopher, Wyoming ground squirrel, sharp-tailed grouse, and Greater sage-grouse. Water features are sparse provided by seasonal runoff, artificial water catchments, and springs. State 1 Phase 1.1 – Idaho Fescue/ Bluebunch Wheatgrass/ Slender Wheatgrass/ Mountain Brome Reference Plant Community (RPC): This plant community provides a diversity of grasses and forbs used by native insect communities that assist in pollination. An extensive array of forbs is represented throughout the growing season leading to a diverse insect community. The reptile and amphibian community is represented by gopher snake, western rattlesnake, terrestrial gartersnake, western toad, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Sage-grouse may utilize this site for brood rearing, winter cover, and winter food. Sharp-tailed grouse may utilize this plant community. The plant community provides spring, summer, and fall forage for mule deer and elk. A diverse small mammal population including golden-mantled ground squirrels, jackrabbits, Uinta ground squirrel, Idaho pocket gopher, and deer mice may utilize this plant community. State 1 Phase 1.2 – Slender Wheatgrass/ Mountain Brome Plant Community: This plant

community is the result of improper grazing management and no fire. An increase in canopy cover of brush may occur with a decline in vigor and production of native deep rooted grasses and forbs. The reduced diversity of herbaceous understory results in lower diversity of insects. The reptile community would be similar to the reptile community in State 1 Phase 1.1. The increase in the shrub component may increase the quality of habitat for bird species reliant on vertical structure not present in State 1 Phase 1.1. Shrub obligate bird species like sage sparrow and brewer's sparrow may begin to utilize the site. Quality of brood-rearing habitat for sage-grouse would be similar to that in State 1 Phase 1.1. Habitat quality for sharp-tailed grouse may increase as patches of shrubs become established. The reduced vigor and production of herbaceous vegetation provides a shorter grazing season for mule deer and elk. Small mammal diversity and populations would be similar to those in State 1 Phase 1.1. State 1 Phase 1.3– Bluebunch Wheatgrass/ Slender Wheatgrass/ Mountain Brome Plant Community: The plant community is a result of recent wildfire, prescribed burning, or brush management. Patches of root sprouting shrubs (mountain snowberry and gray horsebrush) may be present to provide limited vertical structure for wildlife. Insect diversity would be reduced but a native forb plant community similar to that in State 1 Phase 1.1 would still support select pollinators. Habitat quality for reptiles would be similar to State 1 Phase 1.1 habitat quality. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collected all available water would exclude amphibians on these sites. Bird species that favor grassland habitat would include horned lark, savannah sparrow, vesper sparrow, and western meadowlark. Sage-grouse may use this site for brood-rearing habitat when sagebrush cover is nearby. Habitat quality for sharp-tailed grouse may increase as patches of shrubs become established. Mule deer and elk use would be seasonal (spring and fall). The diversity and populations of small mammals would be similar to those in State 1 Phase 1.1. State 2 – Annuals/ Invasive/ Noxious Weeds Plant Community: This state has developed due to improper grazing management and/or frequent fire. The reduction of native forbs in the plant community would support a very limited population of pollinators. Season long pollinator habitat is not provided at the same level as in State 1 Phase 1.1. Habitat quality would decline for reptile species identified in State 1 due to poor cover and food habitat. Birds of prey including hawks and falcons may range throughout this area looking for prey species. Large herbivores may utilize the herbaceous vegetation in the early part of the year when it is more palatable. Kentucky bluegrass, when managed properly, can provide desirable forage in spring and fall for mule deer and throughout the year for elk. The populations of small mammals would be dominated by open grassland species. Hunting success by predators on small mammals would increase. State 3 – Rangeland Seeding Plant Community: The seeding mixture (native or non-native) determines the animal species that would utilize this site. A diverse seed mixture of native grasses and forbs would provide similar habitat conditions as in the herbaceous plant community described in State 1 Phase 1.1, 1.21 and 1.3. A monoculture of non-native grass species would not support diverse populations of insects, reptiles, birds, or mammals. Given a monoculture of herbaceous vegetation, grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat, mule deer, and elk may utilize this site for nesting and/or foraging at certain times of the year. Birds of prey including hawks and falcons may range throughout this community looking for prey species. Grazing Interpretations This site is suitable for late spring, summer, and fall grazing by livestock. Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use, and seasonal preference. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings.

Hydrological functions

The soils in this site are in hydrologic group C. They have moderately high runoff potential.

Recreational uses

This site provides some aesthetic values through summer blooming forbs. It is often adjacent to forested areas, thus providing a contrasting landscape for the viewer. Some hunting of upland game occurs on the site.

Wood products

None.

Other products

None.

Other information

Field Offices Grangeville, ID Nez Perce, ID Cascade, ID Weiser, ID Emmett, ID Mtn. Home, ID Salmon, ID Challis, ID Shoshone, ID Arco, ID St. Anthony, ID Lewiston, ID Orofino, ID

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Those involved in developing this site description include: Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC Jim Cornwell, Range Management Specialist, IASCD Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho Bruce Knapp, Resource Soil Scientist, NRCS, Idaho Lee Brooks, Range Management Specialist, IASCD

Other references

USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.

USDA, NRCS.2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, Forest Service, Fire Effects Information Database. 2004. www.fs.fed.us/database/feis.

USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; Version 4-2005.

Approval

Scott Woodall, 2/03/2020

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.

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Date	06/02/2009
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rills are rare on this site. If rills are present they are likely to occur immediately following wildfire and on soils with surface textures of silt loam and clay loam.

2. **Presence of water flow patterns:** water-flow patterns are rare on this site. When they occur, they are short and disrupted by cool season grasses and shrubs and are not extensive.

3. Number and height of erosional pedestals or terracettes: both are rare on the site. In areas where flow patterns and/or rills are present, a few pedestals may be expected.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground): data is not available. On areas in mid-seral status bare ground may range from 10 to 20 percent.

5. Number of gullies and erosion associated with gullies: none.

6. Extent of wind scoured, blowouts and/or depositional areas: are not present. Immediately following wildfire some soil movement may occur on lighter textured soils.

7. Amount of litter movement (describe size and distance expected to travel): fine litter in the interspaces may move up to 2 feet following a significant run-off event. Coarse litter generally does not move.

8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values): values should range from 4 to 6 but needs to be tested.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): The A or A1 horizon is typically 8 to 11 inches thick and is dark grayish brown or brown when moist. Structure ranges from weak to medium fine and very fine granular. Soil organic matter (SOM) ranges from 1 to 5 percent.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): is not present.

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: cool season deep-rooted perennial bunchgrasses

Sub-dominant: forbs

Other: tall shrubs

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Idaho fescue and bluebunch wheatgrass can become decadent in the absence of normal fire frequency and ungulate grazing. This is evident by dead centers in the crowns.
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14. Average percent litter cover (%) and depth (in): additional litter cover data is needed but is expected to be 20-30 percent to a depth of 0.1 inches. Under mature shrubs litter is >0.5 inches deep and is 90-100 percent ground cover.
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15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): is 2400 pounds per acre (2688 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 70-80 percent of the total production, forbs 15-25 percent and shrubs 5 percent.
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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: includes cheatgrass, bulbous bluegrass, Kentucky bluegrass, rush skeletonweed, musk and scotch thistle, diffuse and spotted knapweed, leafy spurge, dalmation toadflax, and yellow star thistle.
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17. Perennial plant reproductive capability: all functional groups have the potential to reproduce in most years.
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