

## Ecological site R043BY021ID Mountain Loamy 22+ PZ FEID/POGR9-GEVI2

Last updated: 2/03/2020  
Accessed: 05/05/2024

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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):

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](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook).

### Classification relationships

*Artemisia vaseyana/ Festuca idahoensis* HT in “Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number “35”.

### Ecological site concept

- Site receives no additional water.
- Slope is <30%
- Soils are:
  - 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 = 35% 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
  - o Non-saline, sodic, or saline-sodic

### Associated sites

R043BY002ID	Granitic 22+ PZ ARTRV/FEID
R043BY003ID	Loamy 22+ PZ FEID-PSSPS

R043BY009ID	Loamy 16-22 PZ ARTRV/FEID
R043BY016ID	Shallow Gravelly 16-22 PZ ARAR8/FEID

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

This site occurs on gentle side slopes, benches, and ridges with elevations from 6800-10000 feet (2050-3000 meters). Slopes range from 2 to 30 percent. Average annual precipitation typically ranges from 22 inches (56 cm.) or greater.

**Table 2. Representative physiographic features**

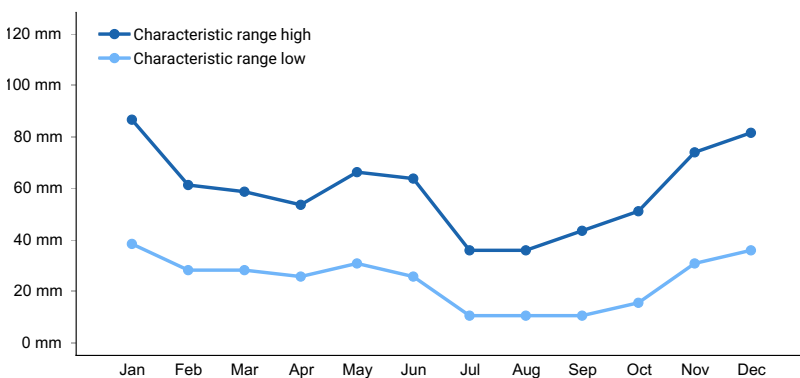
Landforms	(1) Hill
Elevation	2,073–3,048 m
Slope	2–30%
Aspect	Aspect is not a significant factor

## 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)	116 days
Precipitation total (average)	610 mm



**Figure 1. Monthly precipitation range**

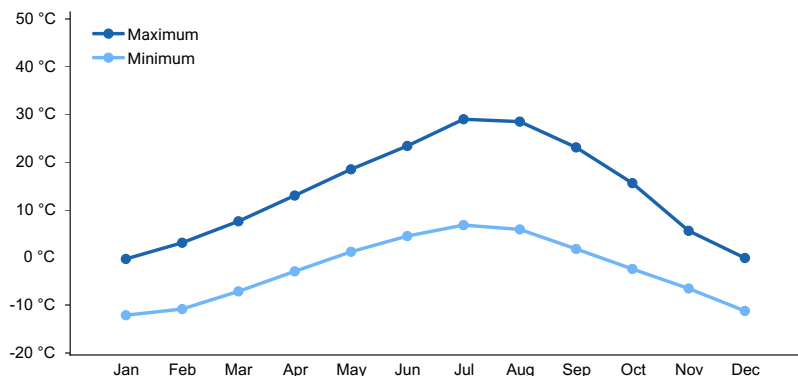


Figure 2. Monthly average minimum and maximum temperature

## Influencing water features

This site is not influenced by adjacent wetlands or streams. Run-on may influence this site on its periphery.

## Soil features

The soils on this site are loams with subsoils of loams to gravelly loams. The soil surface is generally dark brown loam, high in organic matter. Subsoils are loams to gravelly loams. Soils are well drained with permeability ranging from moderately slow to slow. The soils are saturated early in the growing season (possibly from frozen subsoils). The soils have a moderate erosion hazard.

### Soil Series Correlated to this Ecological Site

No Data

## Ecological dynamics

The dominant visual aspect of the site is an equal mix of grasses and forbs. Shrubs occur in minor amounts. Composition by weight is approximately 45-55 percent grasses, 40-50 percent forbs, and 3-8 percent shrubs.

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

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 mountain brome, slender wheatgrass, and purple oniongrass in the understory and slender cinquefoil and sticky geranium in the overstory. Subdominant species include Columbia needlegrass, Letterman's needlegrass, silvery lupine, and mountain big sagebrush. There is a large variety of other forbs that can occur in minor amounts. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 2200 pounds per acre (2444 kilograms per hectare) in a normal year. Production in a favorable year is 2750 pounds per acre (3055 kilograms per hectare). Production in an unfavorable year is 1250 pounds per acre (1388 kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are about equal to perennial forbs while shrubs are subdominant.

## FUNCTION:

This site is suited for grazing by domestic livestock in late spring, summer, and fall. This site provides fair to good habitat for various upland wildlife. This site offers minimal recreation value. Use by big game animals and summer-blooming forbs offers some visual aesthetic values.

Due to the relatively high precipitation and lack of surface stones on this site, it is susceptible to degradation from erosion. Early spring grazing should be avoided due to the saturated soil conditions.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, mountain big sagebrush can gradually increase on the site. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, mountain big sagebrush can displace most of the primary understory species.

When fires become more frequent than historic levels (20-40 years), mountain big sagebrush is reduced significantly. Perennial forbs will increase. With continued short fire frequency, mountain big sagebrush can be completely eliminated along with many of the desirable understory species. These species may be replaced by Kentucky bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. These fine fuels will increase the fire frequency.

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.

Continued improper grazing management influences fire frequency by increasing fine fuels. The site then becomes susceptible to an invasion of noxious and invasive plants and/or soil erosion.

Proper grazing management that addresses frequency, duration, and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in perennial forbs and mountain big sagebrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any prescribed burn needs to be carefully planned on this site due to the species diversity, precipitation, and elevation.

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.

Below normal temperatures in the spring can have an adverse impact on total production irregardless of the precipitation. 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:

Insect and disease outbreaks can affect vegetation health. Grasshopper outbreaks occur periodically. Since defoliation usually happens once during the growing season, mortality is normally low.

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

Watershed:

Decreased infiltration and increased runoff occur with an increase in forbs and mountain big sagebrush. Desired understory species can be reduced. 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.

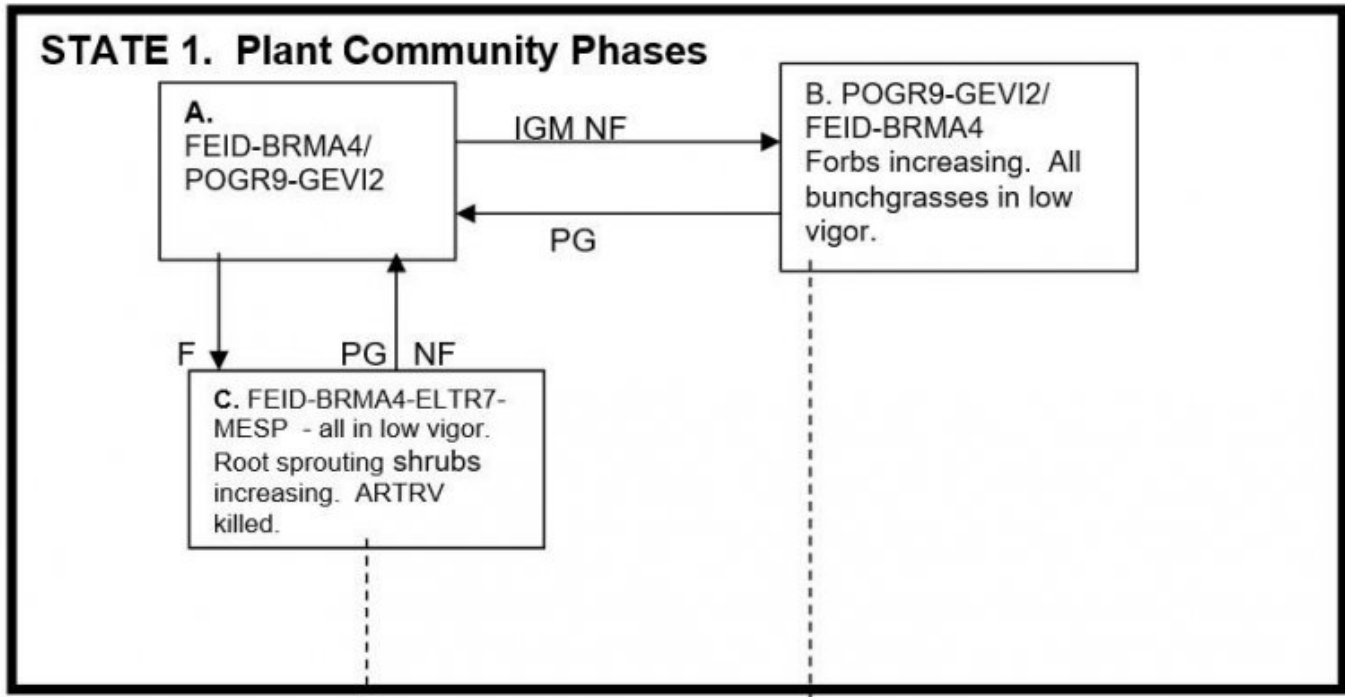
State 1 Phase B or C to State 2. Develops through frequent fire and/or continued improper grazing management. The site crosses the threshold. It is not economically feasible to move this state back to State 1 with accelerating practices.

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 not economically feasible to move this state back to State 1 with accelerating practices.

Practice Limitations.

Only slight limitations exist on this site for accelerating, facilitating and vegetative management practices. Removal of mountain big sagebrush can result in accelerated soil erosion.

## **State and transition model**



**STATE 2.**  
ANNUAL FORBS AND GRASSES  
DOMINANT.  
POPR HAS INVADED. ROWO resprouted

UNKNOWN AND  
NEW SITE

**LEGEND**

IGM- Improper grazing management  
 PG- Prescribed grazing  
 FF- Frequent fire  
 NF- No fire  
 F- Fire

→ Community pathway (within states)  
 - - - -> Reversible transition  
 ———> Threshold  
 ———> Irreversible transition

**PLANT LEGEND FOR STATES 1&2**

BRMA4 - Mountain Brome  
 ELTR7 - Slender Wheatgrass  
 MESP - Purple Oniongrass  
 POPR - Kentucky Bluegrass  
 POGR9 - Slender Cinquefoil  
 GEVI2 - Sticky Geranium  
 ARTRV - Mountain Big Sagebrush

**State 1**  
**State 1 Phase A**

**Community 1.1**  
**State 1 Phase A**

Reference Plant Community Phase. This plant community is dominated by Idaho fescue and mountain brome in the

understory and slender cinquefoil and sticky geranium in the overstory. Subdominant species include slender wheatgrass, purple oniongrass, Columbia needlegrass, Letterman's needlegrass, silvery lupine, and mountain big sagebrush. There is a large variety of other forbs that can occur in minor amounts. Natural fire frequency is 20-40 years.

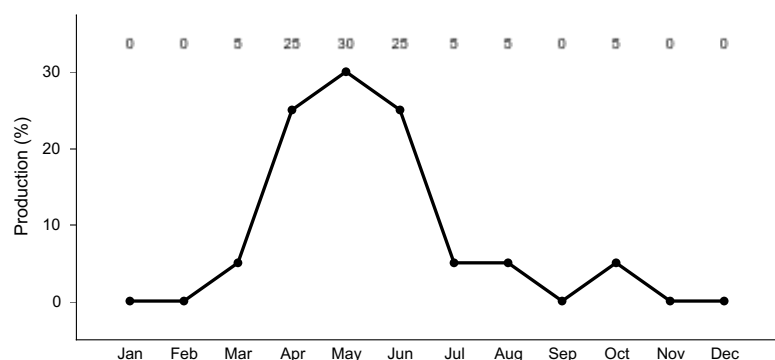


Figure 3. Plant community growth curve (percent production by month). ID1205, FEID-PSSPS. State 1.

**State 2**  
**State 1 Phase B**

**Community 2.1**  
**State 1 Phase B**

This plant community is dominated by slender cinquefoil, sticky geranium, and a variety of forbs with reduced amounts of Idaho fescue, slender wheatgrass, purple oniongrass, and mountain brome. Forbs are increasing. All deep-rooted bunchgrasses are typically in low vigor. This phase has developed due to improper grazing management and no fire.

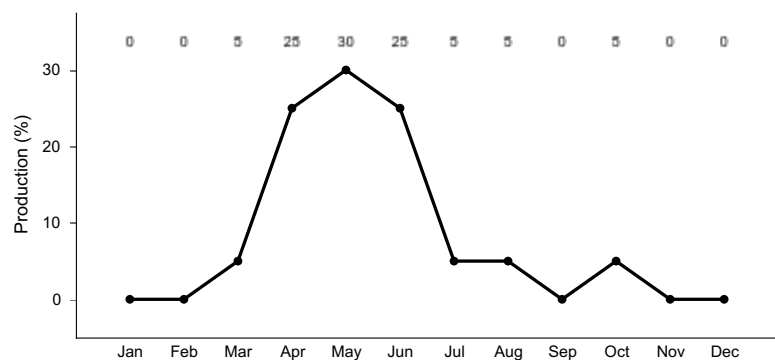
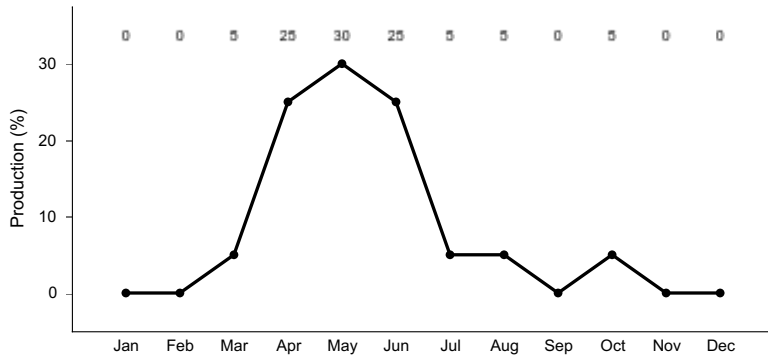


Figure 4. Plant community growth curve (percent production by month). ID1205, FEID-PSSPS. State 1.

**State 3**  
**State 1 Phase C**

**Community 3.1**  
**State 1 Phase C**

This plant community is dominated by Idaho fescue, mountain brome, slender wheatgrass, and purple oniongrass but they have reduced vigor. Forbs remain about in the same proportion as Phase A. Mountain big sagebrush has been killed. Woods' rose has re-sprouted. This plant community is the result of wildfire.

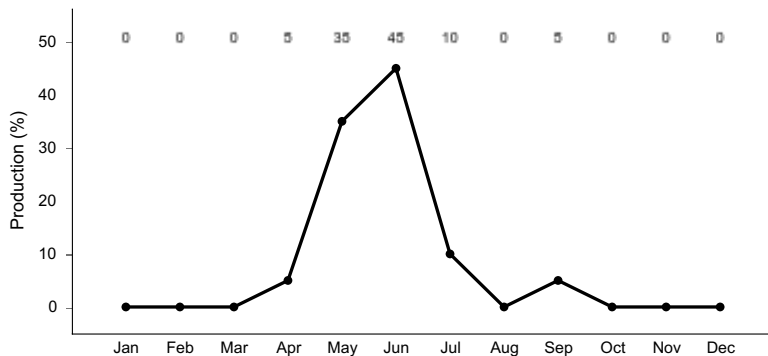


**Figure 5. Plant community growth curve (percent production by month). ID1205, FEID-PSSPS. State 1.**

**State 4  
State 2**

**Community 4.1  
State 2**

This plant community is dominated by shallow rooted annual forbs and grasses. Root sprouting shrubs such as Woods' rose can be present, dependent upon, how frequent, fire has occurred. Kentucky bluegrass has invaded. Some soil loss has occurred. This state has developed due to frequent fires and/or improper grazing management from Phase B or C, State 1. The site has crossed the threshold. It is not economically feasible to move this state back to State 1 with accelerating practices.



**Figure 6. Plant community growth curve (percent production by month). ID1211, ANNUAL FORBS AND GRASSES. State 2.**

**State 5  
Unknown New Site**

**Community 5.1  
Unknown New Site**

This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This state has developed due to continued improper grazing management and/or frequent fires. It is not economically feasible to move this state back to State 1 with accelerating practices.

**Additional community tables**

**Animal community**

Wildlife Interpretations.

Animal Community – Wildlife Interpretations



This ecological site provides diverse habitat for upland wildlife species. Habitat is provided for resident and migratory animals including western toad, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, grasshopper sparrow, horned lark, and western meadowlark. Large herbivore use of the ecological site is dominated by mule deer and elk. Area sensitive species include western toad, Greater sage-grouse, and sharp-tailed grouse. Open water is seasonal, being provided by seasonal runoff, ponding, and natural springs.

**State 1 Phase 1.1 - Idaho Fescue/ Mountain Brome/ Slender Cinquefoil/ Sticky Geranium Reference Plant Community (RPC):** The RPC provides a diversity of grasses and forbs used by native insect communities who assist in pollination of the plant community. The high level of forb production supports insects that are food for the many predator species utilizing the site. The reptile and amphibian community is represented by rubber boa, western toad, and northern leopard frog. Amphibians are associated with springs adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Sage-grouse utilize the meadows as summer and fall brood-rearing habitat. The plant community supports spring, summer, and fall forage for elk and spring and fall forage for mule deer. A diverse small mammal population including deer mouse, meadow vole, Merriam's shrew, and yellow-bellied marmot may utilize the site.

**State 1 Phase 1.2 - Slender Cinquefoil/ Sticky Geranium/ Idaho Fescue/ Mountain Brome Plant Community:** This phase has developed due to improper grazing management and no fire. Insect diversity and populations would be similar to those in the State 1 Phase 1.1 plant community. The reptile and amphibian community would be similar to the State 1 Phase 1.1 community. This plant community provides summer and fall brood-rearing habitat for sage-grouse. The plant community can provide forage for large herbivores but with continued improper grazing management quality and quantity of forage would be reduced in the summer and fall. A diverse small mammal population including deer mouse, meadow vole, Merriam's shrew, and yellow-bellied marmot may utilize the site.

**State 1 Phase 1.3 - Idaho Fescue/ Mountain Brome/ Slender wheatgrass/ Purple Oniongrass Plant Community:** This plant community is the result of wildfire. Under proper grazing management the plant community would develop to be similar to the State 1 Phase 1.1 plant community. Under proper grazing management the animal community would develop over time to be similar to the State 1 Phase 1.1 animal community.

**State 2 –Annual Forbs/ Annual Grasses/ Kentucky Bluegrass Plant Community:** This state has developed due to frequent fires and/or improper grazing management. Pollinator habitat may not be sustained throughout all seasons. Nesting habitat for grassland birds would be limited due to poor cover from annual grasses and forbs. Birds of prey may range throughout these areas looking for prey species. The mule deer and elk grazing season would be shortened due to poor vigor and production of herbaceous vegetation. When properly managed, Kentucky bluegrass can provide desirable forage for deer and elk. Small mammal populations and diversity would be reduced due to the reduced vertical structure and increased vulnerability from predators.

#### **Grazing Interpretations:**

This site is suited for grazing by domestic livestock in late spring, summer, and fall.

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**

Soils on this site have a moderate erosion hazard.

### **Recreational uses**

This site offers minimal recreation value. Use by big game and summer-blooming forbs offers some aesthetic values.

### **Wood products**

None.

## Other products

None.

## Other information

Field Offices

St. Anthony, ID  
Arco, ID  
Cascade, ID  
Challis, ID  
Nezperce, ID  
Emmett, ID  
Grangeville, ID  
Gooding, ID  
Lewiston, ID  
Mountain Home, ID  
Orofino, ID  
Salmon, ID  
Shoshone, ID  
St. Anthony, ID  
Weiser, 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

## Type locality

Location 1: Clark County, ID	
General legal description	U.S. Sheep Experiment Station-Summer range in the Centennial Mountains of Idaho-Montana.

## Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number "35".  
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](http://www.fs.fed.us/database).  
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

## 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)	Dave Franzen and Jacy Gibbs Intermountain Range Consultants 17700 Fargo Rd. Wilder, ID 83676
Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	06/15/2009
Approved by	Scott Woodall
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

- Number and extent of rills:** rills can occur on this site. If rills are present they are likely to occur on slopes greater than 15 percent immediately following wildfire or a high intensity convection storm.

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- Presence of water flow patterns:** water-flow patterns occur on this site usually where slopes are greater than 15 percent. When they occur, they are short and disrupted by cool season grasses and forbs and are not extensive.

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- Number and height of erosional pedestals or terracettes:** both occur on this site but neither is extensive. In areas where flow patterns and/or rills are present, a few pedestals may be expected. Terracettes occur uphill from large bunchgrasses and forbs.

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- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** data is not available. Rodent activity is common on this site. Where rodent activity is abundant, increased bare ground should be expected.

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- Number of gullies and erosion associated with gullies:** gullies do not occur on this site.

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

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- 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.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** values should range from 4 to 6 but needs to be tested.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** No data.
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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.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** is not present.
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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: cool season deep rooted perennial bunchgrasses perennial forbs

Sub-dominant: perennial forbs tall shrubs

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** most of the perennial grasses will become decadent in the absence of normal fire frequency and ungulate grazing. Decadence is usually in the form of litter build-up in the crown of the plant. Over an extended period of time the center of the plant may die. Grass and forb mortality will occur as tall shrubs increase.
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14. **Average percent litter cover (%) and depth ( in):** additional litter cover data is needed but is expected to be 10-20 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 2200 pounds per acre (2444 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 45-55 percent of the total production, forbs 40-50 percent, and shrubs 3-8 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, medusahead, ventenata, Kentucky bluegrass, leafy spurge, curlycup gumweed, St. Johnswort, rush skeletonweed, musk, yellow star, and scotch thistle, and diffuse and spotted knapweed.

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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in most years.
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