USDA Natural Resources
Conservation Service

Ecological site R009XY012ID
South Slope Loamy 12-16 PZ PSSPS-POSE

Last updated: 9/23/2020
Accessed: 05/20/2024

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.

Classification relationships

No data.

Associated sites

R009XY005ID	**North Slope Loamy 12-16 PZ**
R009XY006ID	**Loamy 12-16 PZ**
R009XY011ID	**Stony Loam 12-16 PZ PSSPS-POSE**
R009XY017ID	**Very Shallow 12-22 PZ PSSPS-POSE**

Similar sites

R009XY006ID	**Loamy 12-16 PZ**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on moderately steep to steep south facing slopes generally greater than 30 percent. Elevations usually range from 1000-2500 feet (300-750 meters).

Climatic features

The elevation of MLRA 9 ranges from 2000 to 4000 feet with an average elevation of 3000 feet. Elevation along major streams averages only 650 feet above sea level. Average annual precipitation ranges from 20 to 25 inches with an average of 23 based on 9 long term climate stations located throughout the MLRA. Summers are relatively dry while precipitation is evenly distributed between fall, winter, and spring.
The maximum average annual temperature is 58 degrees Fahrenheit while the average minimum temperature is 35 degrees F. The average annual temperature is 46.8 degrees F. The frost free period ranges from 107 to 134 days and the freeze free period ranges from 143 to 173 days.

Table 2. Representative climatic features

Frost-free period (average)	134 days

Freeze-free period (average)	173 days
Precipitation total (average)	660 mm

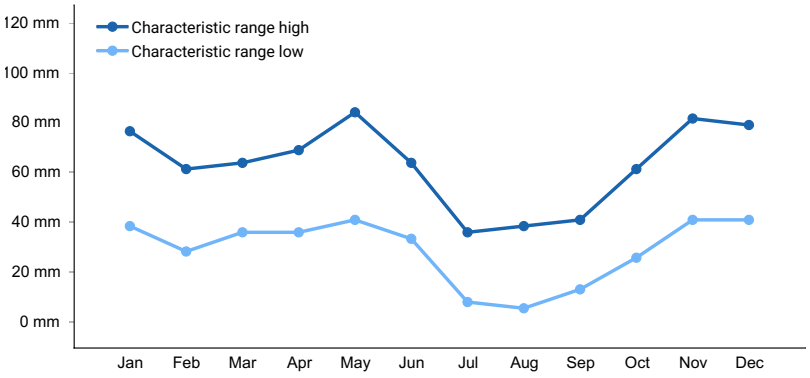


Figure 1. Monthly precipitation range

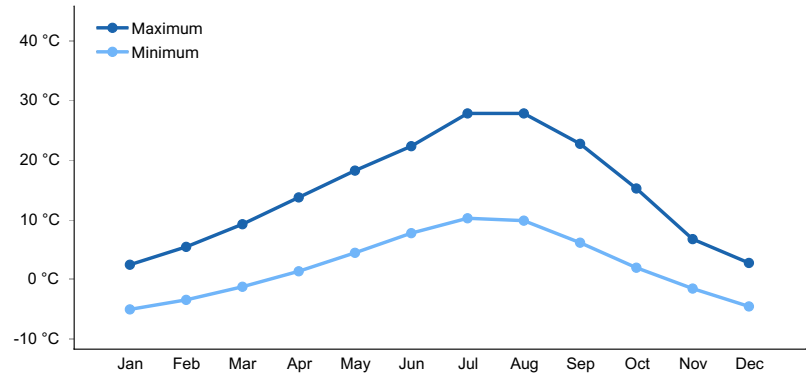


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils well drained and generally moderately deep to deep loams and silt loams. Available water capacity is low. Permeability is moderate to moderately slow and runoff is medium to high. Reaction in the surface layer ranges from neutral to slightly alkaline. These soils are characterized by xeric moisture and mesic temperature regimes.

Soil Series Correlated to this Ecological Site

Tannahill

Table 3. Representative soil features

Surface texture	(1) Cobbly loam (2) Very cobbly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to moderately slow
Soil depth	102–152 cm
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	15–40%

Available water capacity (0-101.6cm)	7.62–9.4 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	15–50%
Subsurface fragment volume >3" (Depth not specified)	30–70%

Ecological dynamics

The dominant visual aspect of this site is grassland with bluebunch wheatgrass dominant. Composition by weight is approximately 70-80% grass, 15-25% forbs, and T-5% 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, whitetail deer, bighorn sheep, Rocky Mountain elk, lagomorphs, and small rodents.

Fire has historically occurred on the site at intervals of 25-40 years.

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 bluebunch wheatgrass and Sandberg bluegrass in the understory. Subdominant species include sand dropseed, Fendler threeawn, prairie junegrass, western yarrow, arrowleaf balsamroot, and longleaf phlox. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

Total annual production is 900 pounds per acre (1008 kilograms per hectare) in a normal year. Production in a favorable year is 1100 pounds per acre (1220 kilograms per hectare). Production in an unfavorable year is 750 pounds per acre (840 kilograms per hectare). Structurally, cool season, deep rooted perennial grasses are dominant followed by perennial forbs while shallow rooted perennial bunchgrasses are subdominant.

This site is suitable for grazing by livestock in spring and early summer. The steeper slopes will limit livestock movement. Excessive trailing of livestock should be avoided to minimize terracette development and erosion on the steeper slopes. This site provides valuable wildlife food and cover for deer, elk, bighorn sheep, raptors, and other small wildlife species.

The soils in this group are in hydrologic group B.

This site has very little recreational or aesthetic value. Hunting opportunities are limited.

Impacts on the Plant Community:

Influence of fire:

When this site burns within the normal fire frequency of 25-40 years, it has minimal effect on the plant community.

In the absence of normal fire frequency residues will build up in the crown of bluebunch wheatgrass. Plant

decadence develops. When fires become more frequent than historic levels (25-40 years), vigor of the bunchgrasses will generally be reduced for a year or two. Root sprouting shrubs such as green rabbitbrush, Woods' rose, and herbaceous sage will increase. With continued short fire frequency, fine leaved grasses will have their vigor reduced significantly and may die out. These species may be replaced by Fendler threeawn, cheatgrass, Sandberg bluegrass, ventenata, and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants.

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, the plant community becomes susceptible to invasion by noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels.

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. Prescribed burns need careful planning. Areas without a suitable understory of perennial grasses are low priority areas for prescribed burns, especially if reseeding is not a possibility.

Due to the unstable soil surface, improper grazing management usually results in the development of terracettes. On steeper slopes massive soil erosion can occur during intense convection storms.

Weather influences:

Above normal precipitation in March, April, and May 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 regardless 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, especially in shallow rooted species. Prolonged drought can lead to a change in fire frequency.

Influence of Insects and disease:

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

An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available.

Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Many of the annual and perennial invasive species with deep root systems 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 yearlong. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff occur with an increase in annual grasses and undesirable forbs. 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 to State 2. Develops through frequent fire and 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.

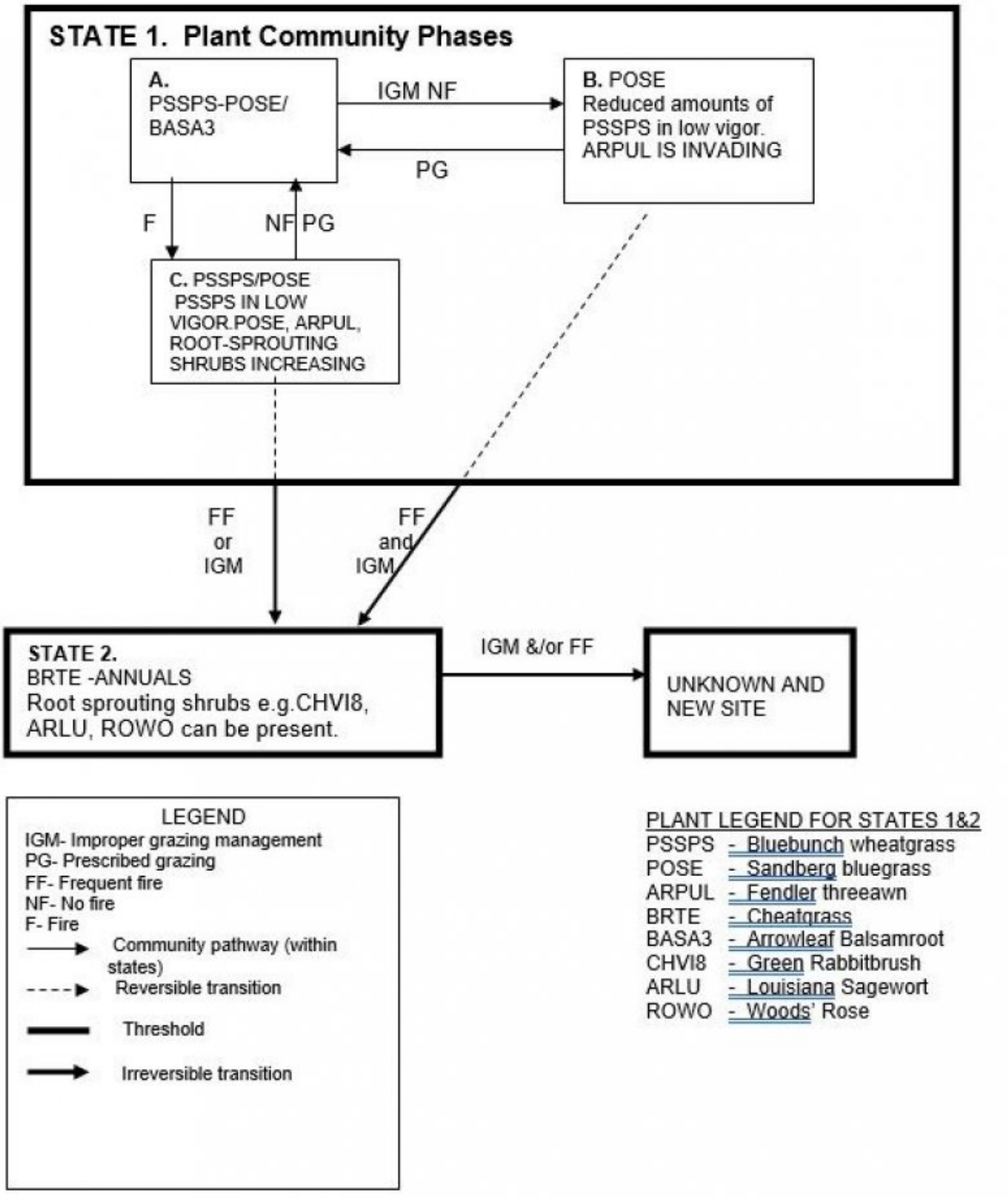
State 1, Phase C to State 2. Develops through frequent fire or continued improper grazing management. The site crosses the threshold. It is not economically feasible to move this state back to State 1 with accelerating practices.

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.

There are severe limitations for seeding and brush management on this site with ground moving equipment due to steep slopes. Attaining uniform utilization on the steeper slopes is difficult.

State and transition model



State 1
State 1 Phase A

Community 1.1
State 1 Phase A

State 1, Phase A. Reference Plant Community Phase. This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass. Arrowleaf balsamroot, sand dropseed, and Fendler threeawn are often

present in the community in minor amounts. Natural fire frequency is 25-40 years.

Table 4. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	628	757	925
Forb	168	202	247
Shrub/Vine	45	50	62
Total	**841**	**1009**	**1234**

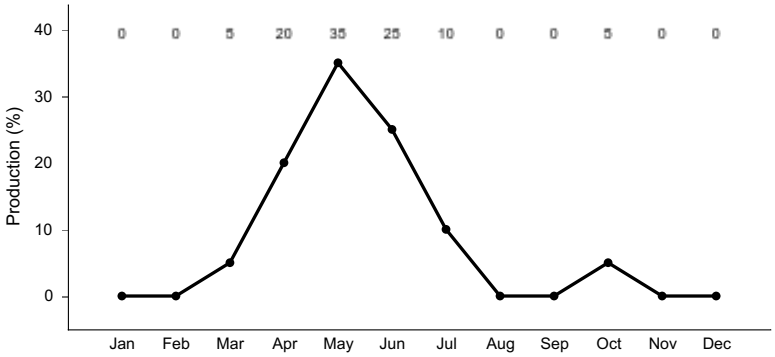


Figure 4. Plant community growth curve (percent production by month). ID0101, B9 PSSPS-FEID REFERENC PLANT COMMUNITY. State 1.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

State 1, Phase B. This plant community is dominated by Sandberg bluegrass with reduced amounts of bluebunch wheatgrass. All deep-rooted bunchgrasses are typically in low vigor. Fendler threeawn has invaded. This state has developed due to improper grazing management and no fire. Some cheatgrass and other invasive annuals may have invaded the site.

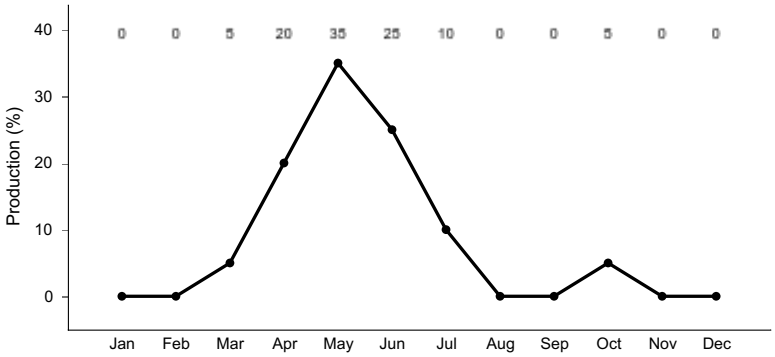


Figure 5. Plant community growth curve (percent production by month). ID0101, B9 PSSPS-FEID REFERENC PLANT COMMUNITY. State 1.

State 3
State 1 Phase C

Community 3.1
State 1 Phase C

State 1, Phase C. This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass with reduced vigor. Forbs remain about in the same proportion as Phase A. Green rabbitbrush, Louisiana sagewort and

Woods' rose have resprouted from fire. Some cheatgrass may have invaded the site. This plant community is the result of wildfire.

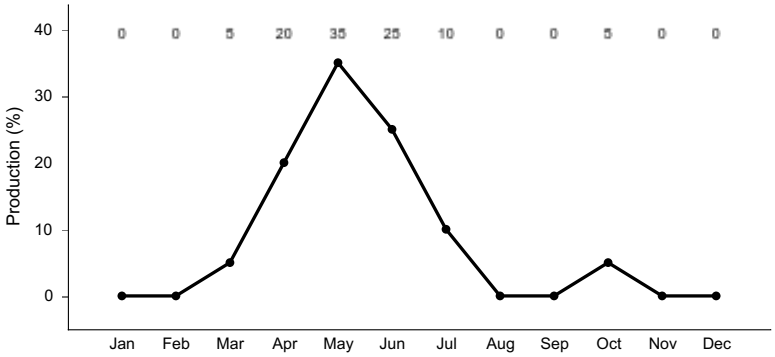


Figure 6. Plant community growth curve (percent production by month). ID0101, B9 PSSPS-FEID REFERENC PLANT COMMUNITY. State 1.

State 4
State 2

Community 4.1
State 2

State 2. This plant community is dominated by Fendler threeawn, cheatgrass, and other annuals. Root sprouting shrubs such as green rabbitbrush, Louisiana sagewort, and Woods' rose can be present, dependent upon, how frequent, fire has occurred. Some soil loss has occurred. This state has developed due to frequent fires and improper grazing management from Phase B, State 2. It also occurs with frequent fire or improper grazing management from Phase 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.

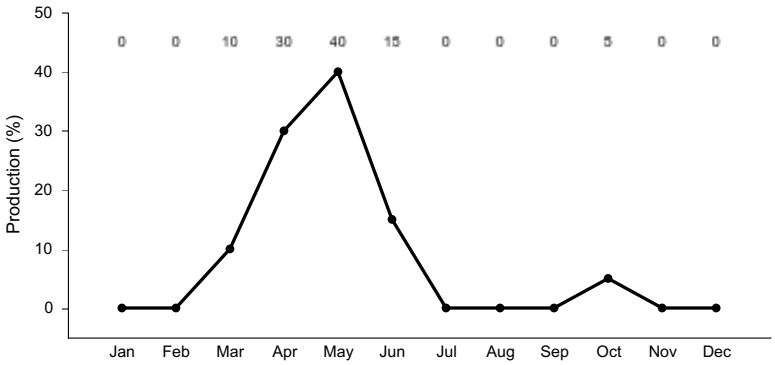


Figure 7. Plant community growth curve (percent production by month). ID0102, B9 BRTE-ANNUALS. State 2.

State 5
State 3

Community 5.1
State 3

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Grass and Grasslike**			–	
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	465–678	–
	Sandberg bluegrass	POSE	*Poa secunda*	129–185	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–22	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–22	–
Forb					
2	**Forbs**			–	
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	78–118	–
	longleaf phlox	PHLO2	*Phlox longifolia*	28–39	–
	common yarrow	ACMI2	*Achillea millefolium*	28–39	–
	silky lupine	LUSE4	*Lupinus sericeus*	28–39	–
	largeflower triteleia	TRGRG2	*Triteleia grandiflora var. grandiflora*	0–22	–
	shaggy fleabane	ERPU2	*Erigeron pumilus*	17–22	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	11–17	–
	Snake River phlox	PHCO10	*Phlox colubrina*	1–17	–
	nineleaf biscuitroot	LOTR2	*Lomatium triternatum*	1–17	–
	blue eyed Mary	COLLI	*Collinsia*	0–11	–
	fireweed	CHANA2	*Chamerion angustifolium ssp. angustifolium*	0–11	–
	woollypod milkvetch	ASPU9	*Astragalus purshii*	0–11	–
Shrub/Vine					
3	**Shrubs**			–	
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	11–17	–
	snow buckwheat	ERNI2	*Eriogonum niveum*	0–11	–
	cushion buckwheat	EROV	*Eriogonum ovalifolium*	0–11	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–11	–
	Woods' rose	ROWO	*Rosa woodsii*	0–6	–

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides diverse habitat for many native wildlife species. The plant community is dominated by herbaceous vegetation which provides year-round forage for large herbivores. Important seasonal habitat is provided for resident and migratory animals including western toad, western rattlesnake, shrews, jackrabbits, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Area sensitive species include Woodhouse’s toad, ring-necked snake, grasshopper sparrow, and Merriam’s shrew. Areas of noxious and invasive plant species (cheatgrass, ventenata, bulbous bluegrass, and rush skeletonweed) can replace native plant species which provide critical feed, brood-rearing, and nesting cover for a variety of native wildlife. Water features are sparse, provided by seasonal runoff, artificial water catchments, and springs.

State 1 Phase 1.1 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Arrowleaf Balsamroot Reference Plant Community (RPC): This plant community provides a diversity of grasses and forbs, used by native insect communities that assist in pollination. The reptile and amphibian community is represented by western rattlesnake, northern alligator lizard, ring-necked snake, pygmy short-horned lizard, western toad, Woodhouse's toad, tiger salamander, Columbia spotted frog, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Spring developments that capture all available water would preclude the use of this site by amphibians. The plant community supports a variety of migratory and resident avian species that prefer grassland plant communities for food, brood-rearing, and nesting cover. They may include savannah sparrow, lark sparrow, grasshopper sparrow, Say's phoebe, western kingbird, horned lark, and western meadowlark. Blue grouse and wild turkey may frequent the site for brood-rearing in the spring and summer. The plant community provides spring, fall, and winter forage for mule deer, white-tailed deer, and elk. Bluebunch wheatgrass and arrowleaf balsamroot are desirable forage species for elk and mule deer. The grazing management will determine the quality and amount of forage available for mule deer and elk. A small mammal population including Preble's shrew, mountain cottontail, white-tailed jackrabbit, Merriam's shrew, western jumping mouse, and deer mouse may utilize this site.

State 1 Phase 1.2 - Sandberg Bluegrass/ Fendler Threeawn Plant Community: This phase has developed due to improper grazing management and no fire. An increase in forbs would continue to support a variety of insects. The reptile and amphibian community is represented by western rattlesnake, gophersnake, terrestrial gartersnake, and western toad. Amphibians are associated with springs adjacent to the site. Spring developments that capture all available water would preclude the use of the area by amphibians. The quality of cover habitat for ground-nesting birds is reduced due to improper grazing, resulting in sparse herbaceous vegetation. The reduced vigor of plants provides a shorter grazing season for mule deer and elk. Quality of winter forage for large herbivores is reduced due to poor grazing management and a loss of native deep-rooted bunchgrasses. The small mammal community would be similar to the State 1 Phase 1.1 small mammal community.

State 1 Phase 1.3 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Fendler Threeawn/ Green Rabbitbrush Plant Community: This plant community is the result of fire. The insect community would be similar to the State 1 Phase 1.1 insect community. Wood's rose and common snowberry may be increasing and would increase pollinator habitat. The reptile community would be similar to the State 1 Phase 1.1 reptile community. Quality of cover and food habitat for birds would be similar to that in State 1 Phase 1.1. Deep-rooted bunchgrasses are reduced in vigor , resulting in a shorter grazing season for mule deer and elk. The small mammal community would be similar to State 1 Phase 1.1 small mammal community. An increase in woody vegetation may increase the quality of cover habitat for large and small mammals.

State 2 – Cheatgrass/ Annuals/ Fendler Threeawn/ Green Rabbitbrush Plant Community: This state has developed due to frequent fires and improper grazing management from State 1 Phase B. It also occurs with frequent fire or improper grazing management from State 1 Phase C. The plant community supports harmful insects, such as grasshoppers due to improved breeding conditions. The plant community would support a very limited population of pollinators. Most reptilian species are not supported with food, water, or cover. The diversity of grassland avian species is reduced due to poor cover and food. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large herbivores may utilize the herbaceous vegetation in the early part of the year when the invasive annuals (cheatgrass) are more palatable. At other times of the year large herbivores would not regularly utilize these areas due to poor forage and cover conditions. The populations of small mammals would be reduced due to poor cover and food habitat. Large blocks of this plant community would fragment the reference plant community and reduce the quality of the habitat for animal species that historically used the site.

Grazing Interpretations.

This site is suitable for grazing by livestock in spring and early summer. The steeper slopes will limit livestock movement. Excessive trailing of livestock should be avoided to minimize terracette development and erosion on the steeper slopes.

Estimated Initial Stocking Rate.
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 group are in hydrologic group B.

Recreational uses

This site has very little recreational or aesthetic value. Hunting opportunities are limited.

Wood products

None.

Other products

None.

Other information

Field Offices

Grangeville, ID
Lewiston, ID
Craigmont, ID
Orofino, ID
Plummer, 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
Lee Brooks, Range Management Specialist, IASCD
Bruce Knapp, Resource Soil Scientist, NRCS, Idaho

Type locality

Location 1: Idaho County, ID

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.
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

Kendra Moseley, 9/23/2020

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	04/16/2009
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills can occur on this site. If rills are present they are likely to occur on the steeper slopes and immediately following wildfire.

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

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are rare on this site and Terracettes are common. Terracettes develop on the uphill side of larger perennial grasses. This accumulation of soil is from concentrated flow and hoof/foot traffic.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Ranges from 50-60%.

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5. **Number of gullies and erosion associated with gullies:** None.

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move up to 3 feet following a significant run-off event. It generally moves onto terracettes. Coarse litter generally does not move except on the steeper slopes. Litter is also moved mechanically by hoof/ foot traffic.

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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):** The surface horizon is typically 3 inches thick. Structure is moderate fine and very fine granular. Soil organic matter (SOM) ranges from 2 to 4 percent.

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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: Deep rooted perennials with fibrous root systema are needed for soil stability.
    cool season deep rooted perennial bunchgrasses

    Sub-dominant: Deep rooted perennials with fibrous root systema are needed for soil stability.
    perennial forbs

    Other: Deep rooted perennials with fibrous root systema are needed for soil stability.
    shallow rooted bunchgrasses

    Additional: Deep rooted perennials with fibrous root systema are needed for soil stability.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Decadence in the larger bunchgrasses can occur on this site. Mortality can occur following extended drought.

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14. **Average percent litter cover (%) and depth (in):** Additional litter cover data is needed but is expected to be 5-10 percent to a depth of <0.1 inches.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Is 900 pounds per acre (1008 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 T-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, soft chess, ventenata, bulbous bluegrass, medusahead, Fendler threeawn, tarweed, curlycup gumweed, spotted and diffuse knapweed, dalmation toadflax, Mediterranean sage, Scotch thistle, Rush skeletonweed, and yellow star-thistle.

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