

Ecological site R009XY016ID Loamy 22+ PZ FEID-PSSPS

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

R009XY001ID	Shallow Stony Loam 16-22 PZ
R009XY002ID	North Slope Loamy 16-22 PZ
R009XY004ID	South Slope Loamy 16-22 PZ
R009XY008ID	Schist 16-22 PZ PSSPS-FEID
R009XY009ID	North Slope Schist 16-22 PZ FEID-PSSPS
R009XY010ID	South Slope Schist 16-22 PZ PSSPS-POSE
R009XY015ID	Dense Stony Clay 22+ PZ DACA3-JUBA

Similar sites

R009XY003ID	Loamy 16-22 PZ
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level mesa-like benches, hills on plateaus, and broad moderately sloping ridgetops. Slopes are generally less than 30 percent. Elevations range from 4000-5500 feet (1200-1650 meters).

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Structural bench (3) Ridge
Elevation	1,219–1,676 m
Slope	1–30%
Water table depth	152 cm

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 3. Representative climatic features

Frost-free period (average)	134 days
Freeze-free period (average)	173 days
Precipitation total (average)	660 mm

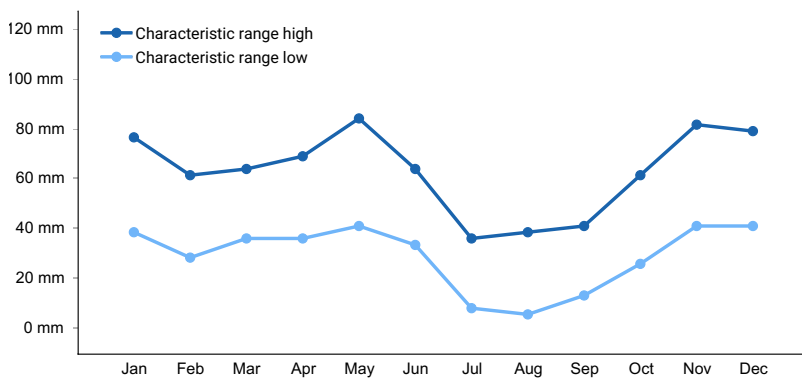


Figure 1. Monthly precipitation range

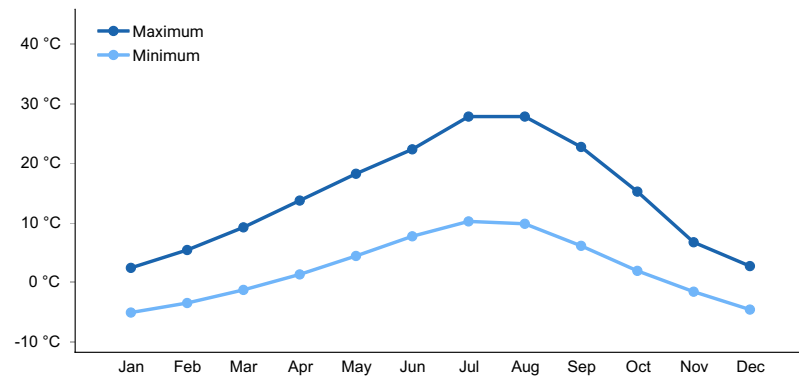


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils are moderately deep to deep, loamy to clayey. Some stones and gravels may be present in the profile. They are well drained to moderately well drained (Sudduth). Permeability and water intake rates are moderate to slow. Runoff is high to very high and available water capacity is low to moderate. These soils are characterized by a xeric moisture regime and the temperature regime is mesic to frigid.

Soil Series Correlated to this Ecological Site

Sweiting
Ferdinand
Jacket
Sudduth

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Slow
Soil depth	51–152 cm
Surface fragment cover <=3"	0–8%
Surface fragment cover >3"	0–2%
Available water capacity (0-101.6cm)	8.13–19.05 cm
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	4.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	2–40%
Subsurface fragment volume >3" (Depth not specified)	5–70%

Ecological dynamics

The dominant visual aspect of this site is grassland and Idaho fescue is dominant grass. The site has a variety of forbs. The bluebunch wheatgrass on the site is usually rhizomatous. Composition by weight is approximately 65-75 percent grass, 15-25 percent forbs, and 5-15 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid 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, white-tailed deer, Rocky Mountain elk, lagomorphs, and small rodents.

Fire has historically occurred on the site at intervals of 20-40 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 Idaho fescue. Subdominant species include bluebunch wheatgrass, prairie junegrass, arrowleaf balsamroot, tapertip hawksbeard, lupine, cinquefoil and penstemon. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 2500 pounds per acre (2800 kilograms per hectare) in a normal year. Production in a favorable year is 2800 pounds per acre (3136 kilograms per hectare). Production in an unfavorable year is 2000 pounds per acre (2240 kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are very dominant, followed by perennial forbs being more dominant than tall shrubs.

This site has high value for late spring, summer, and fall grazing for cattle, sheep and horses. The site is important as late spring, summer, and fall range for big game, especially Rocky Mountain elk, mule deer, and white-tailed deer. Merriam's turkey uses the edges of the site.

The site has high value for upland bird and big game hunting. The aesthetic values are good. A large variety of flora is present which have flowers that bloom in the spring. The site position offers an excellent view of the surrounding countryside, which is usually dissected by deep canyons. The site is popular as a hiking area because of the variety of views offered. This site often occurs adjacent to rock outcrops which harbor golden eagles and hawks which offer bird watching opportunities.

The site is fairly resistant to disturbances that can potentially degrade it as long as a good herbaceous cover is retained.

Impacts on the Plant Community.

Influence of fire:

When this site burns within the normal fire frequency of 20-40 years, it has minimal effect on the plant community.

In the absence of normal fire frequency Woods' rose, snowberry, and willow, when present, will increase slightly. When fires become more frequent than historic levels (20-40 years), vigor of the bunchgrasses will generally be reduced for a year or two. Root sprouting shrubs such as Woods' rose and snowberry will increase. With continued short fire frequency, fine leaved grasses such as Idaho fescue, will have their vigor reduced significantly and death may result. These species may be replaced by cheatgrass, Kentucky bluegrass, 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.

Weather influences:

Above normal precipitation in April, 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 the 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. 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.

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 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 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 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 with continued frequent fire and improper grazing management. This site has crossed 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 has crossed the threshold. It is not economically feasible to move this state back to State 1 with accelerating practices. It is not economically feasible to move this state back to State 1 with accelerating practices.

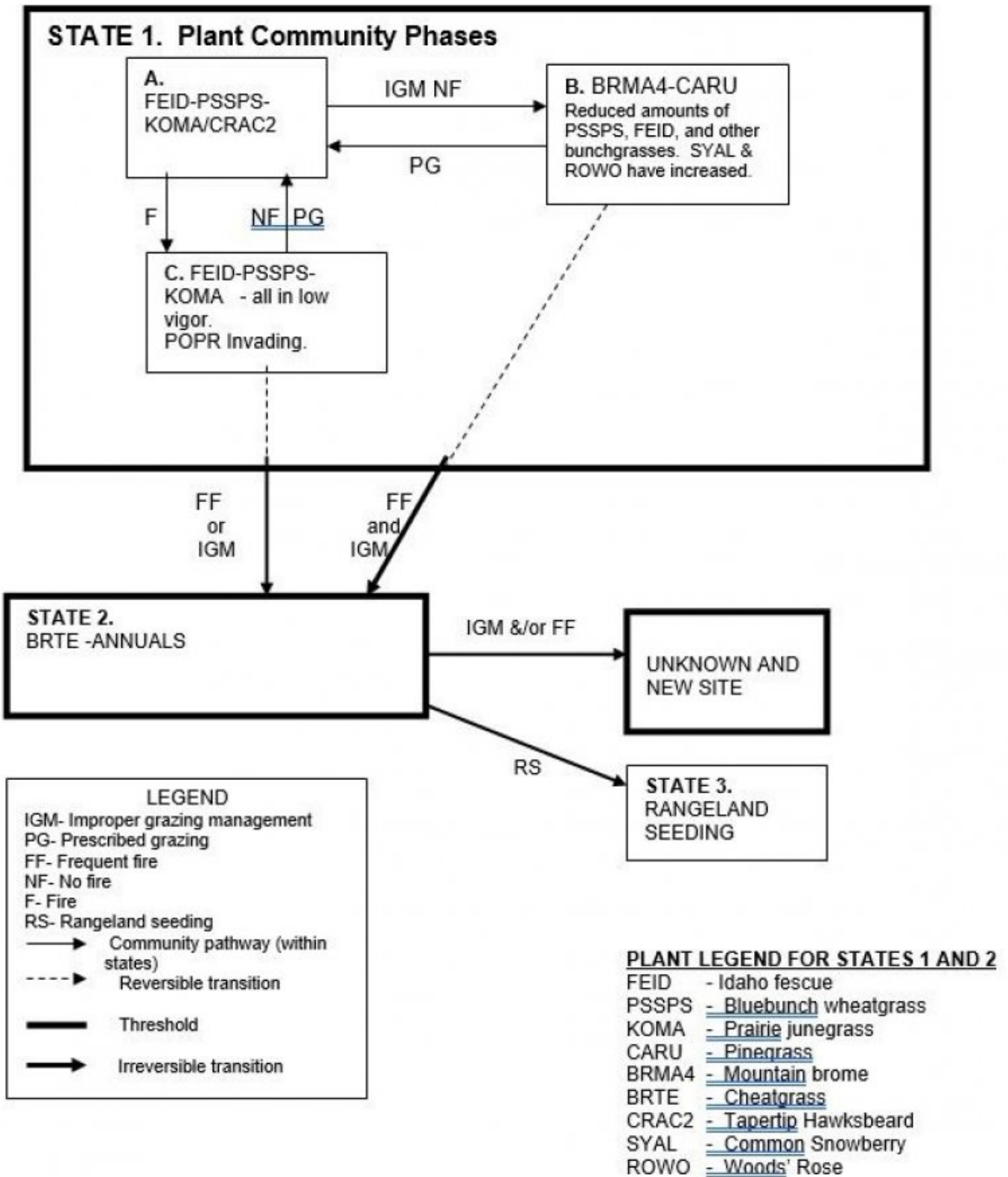
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fire cause this state to cross a threshold and retrogress to a new site with reduced potential. It is not economically feasible to move this state back to State 1 with accelerating practices.

State 3. Rangeland seeding. Results from the site being seeded to introduced species or native species that attempt to mimic the Reference Plant Community.

Practice Limitations.

Only slight limitations exist on this site for accelerating, facilitating and vegetation management practices.

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 Idaho fescue. Subdominant species include bluebunch wheatgrass, prairie junegrass, tapertip hawksbeard, arrowleaf balsamroot, lupine, cinquefoil, and penstemon. Natural fire frequency is 20-40 years.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1569	1961	2197
Forb	448	560	628
Shrub/Vine	224	280	314
Total	2241	2801	3139

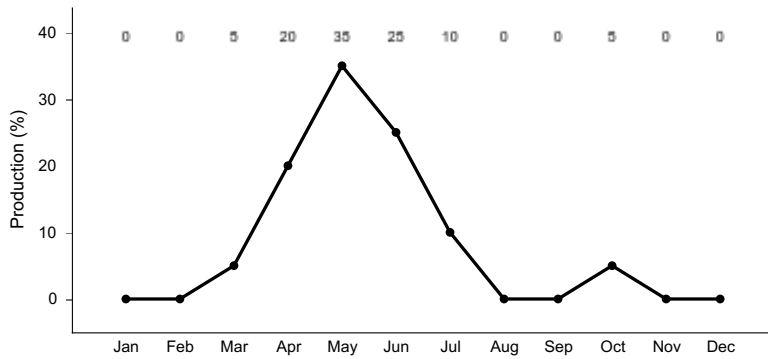


Figure 4. Plant community growth curve (percent production by month). ID0101, B9 PSSPS-FEID REFERENC PLANT COMMUNITY. State 1.

State 2 State 1 Phase B

Community 2.1 State 1 Phase B

State 1, Phase B. This plant community is dominated by mountain brome and pinegrass with reduced amounts of bluebunch wheatgrass and Idaho fescue. All deep-rooted bunchgrasses are typically in low vigor. Snowberry and Woods' rose have increased. This phase has developed due to improper grazing management and no fire. Some Kentucky bluegrass and invasive annuals may have invaded the site.

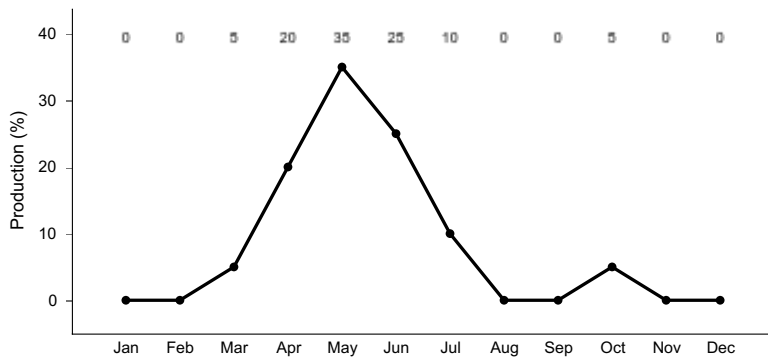


Figure 5. Plant community growth curve (percent production by month). ID0101, B9 PSSPS-FEID REFERENC PLANT COMMUNITY. State 1.

State 3 State 1 Phase C

Community 3.1 State 1 Phase C

State 1, Phase C. This plant community is dominated by Idaho fescue, bluebunch wheatgrass, and prairie junegrass but the plants have reduced vigor. Forbs remain about in the same proportion as Phase A. Rose and snowberry are present due to sprouting. Some Kentucky bluegrass may have invaded the site. This plant community is the result of wildfire.

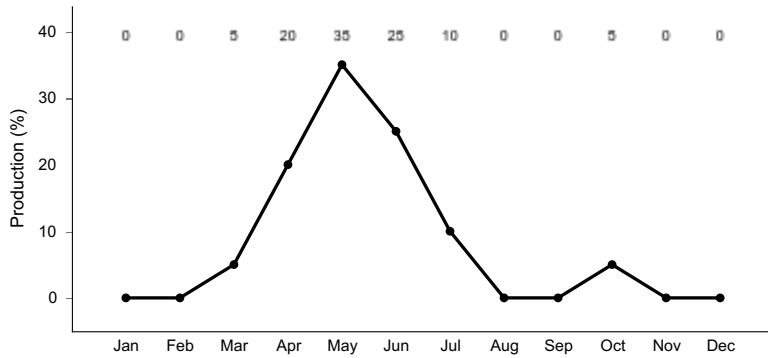


Figure 6. Plant community growth curve (percent production by month). ID0101, B9 PSSPS-FEID REFERENC PLANT COMMUNITY. State 1.

**State 4
State 2**

**Community 4.1
State 2**

State 2. This plant community is dominated by cheatgrass and other invasive and noxious plants. Root sprouting shrubs such as snowberry 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 1. 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.

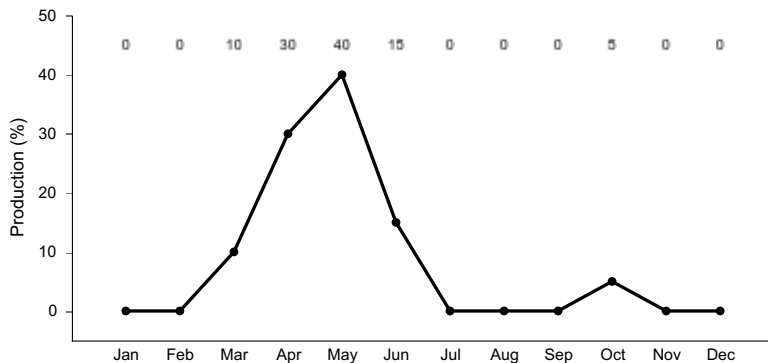


Figure 7. Plant community growth curve (percent production by month). ID0102, B9 BRTE-ANNUALS. State 2.

**State 5
State 3**

**Community 5.1
State 3**

State 3. Rangeland seeding. Results from the site being seeded to introduced species or native species that attempt to mimic the Reference Plant Community.

**State 6
State 4**

**Community 6.1
State 4**

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	Grass and Grasslike			–	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	841–1177	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	448–628	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	280–392	–
	pinegrass	CARU	<i>Calamagrostis rubescens</i>	101–140	–
	Geyer's sedge	CAGE2	<i>Carex geyeri</i>	67–95	–
	California oatgrass	DACA3	<i>Danthonia californica</i>	67–95	–
	mountain brome	BRMA4	<i>Bromus marginatus</i>	45–62	–
	blue wildrye	ELGLG	<i>Elymus glaucus</i> ssp. <i>glaucus</i>	34–45	–
	Columbia needlegrass	ACNEN2	<i>Achnatherum nelsonii</i> ssp. <i>nelsonii</i>	34–45	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	1–34	–
	rush	JUNCU	<i>Juncus</i>	0–34	–
Forb					
2	Forbs			–	
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	101–140	–
	beardtongue	PENST	<i>Penstemon</i>	67–95	–
	old man's whiskers	GETR	<i>Geum triflorum</i>	67–95	–
	nineleaf biscuitroot	LOTR2	<i>Lomatium triternatum</i>	67–95	–
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	67–95	–
	cinquefoil	POTEN	<i>Potentilla</i>	67–95	–
	lupine	LUPIN	<i>Lupinus</i>	67–95	–
	sticky purple geranium	GEVI2	<i>Geranium viscosissimum</i>	67–95	–
	silvery lupine	LUAR3	<i>Lupinus argenteus</i>	56–78	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	45–62	–
	milkvetch	ASTRA	<i>Astragalus</i>	45–62	–
	willowherb	EPILO	<i>Epilobium</i>	45–62	–
	pale agoseris	AGGL	<i>Agoseris glauca</i>	45–62	–
	buckwheat	ERIOG	<i>Eriogonum</i>	34–45	–
	longleaf phlox	PHLO2	<i>Phlox longifolia</i>	1–34	–
	white hawkweed	HIAL2	<i>Hieracium albiflorum</i>	0–34	–
	oneflower helianthella	HEUN	<i>Helianthella uniflora</i>	0–34	–
	fernleaf biscuitroot	LODI	<i>Lomatium dissectum</i>	0–34	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–34	–
	twinleaf bedstraw	GABI	<i>Galium bifolium</i>	0–17	–
	fiveleaf cinquefoil	PONIP	<i>Potentilla nivea</i> var. <i>pentaphylla</i>	0–17	–
	vetch	VICIA	<i>Vicia</i>	0–17	–
	red besseya	BERU	<i>Besseya rubra</i>	0–17	–
	strawberry	FRAGA	<i>Fragaria</i>	1–17	–

Shrub/vine					
3	Shrubs			-	
	common snowberry	SYAL	<i>Symphoricarpos albus</i>	135–191	-
	Woods' rose	ROWO	<i>Rosa woodsii</i>	78–112	-

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 that provides spring, summer and fall, forage for large herbivores. Important seasonal habitat is provided for resident and migratory animals including western toad, western rattlesnake, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk, prairie falcon, blue grouse, 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, rush skeletonweed, and yellow star-thistle) 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 - Idaho Fescue/ Bluebunch Wheatgrass/ Prairie Junegrass/ Tapertip Hawksbeard Reference Plant Community (RPC): This plant community provides a diversity of grasses, forbs, and shrubs used by native insect communities that assist in pollination. The forbs and woody vegetation provide spring, summer, and fall pollinator habitat. The grasses provide habitat for caterpillars and beetles. 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, summer, and fall forage for mule deer, white-tailed deer, and elk. Idaho fescue, bluebunch wheatgrass, Wood's rose, and snowberry are desirable forage for elk, white-tailed deer, and mule deer. The grazing management plan will determine the quality and amount of available forage for 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 – Mountain Brome/ Pinegrass Plant Community: This phase has developed due to improper grazing management and no fire. An increase in canopy of snowberry and Wood's rose contributes to a sparse herbaceous understory. Habitat for pollinators may decline due to a reduction of forbs. The reptile and amphibian community is represented by western rattlesnake, gophersnake, terrestrial gartersnake, and western toad. Spring developments that capture all available water would preclude the use of the area by amphibians. Quality of cover for ground-nesting birds is reduced due to improper grazing, resulting in a sparse understory. The reduced vigor of deep-rooted herbaceous plants from improper grazing management results in a shorter grazing season for mule deer and elk. Kentucky bluegrass is increasing and is desirable forage for large herbivores but may not be available under certain grazing management practices. Areas where shrubs have increased may provide additional browse for large herbivores. Small mammal populations would be similar to those in State 1 Phase 1.1.

State 1 Phase 1.3 - Idaho Fescue/ Bluebunch Wheatgrass/ Prairie Junegrass/ Kentucky Plant Community: This plant community is the result of fire. An increase in canopy of snowberry and Wood's rose contributes to a sparse herbaceous understory. An increase in flowering woody plants may compensate pollinators for the loss of forbs in the plant community. The reptile community would be similar to the State 1 Phase 1.1 reptile community. Quality of cover and forage habitat for birds is reduced due to low vigor and production of historic herbaceous vegetation. The reduced vigor of herbaceous plants and improper grazing management, results in a shorter grazing season for mule deer and elk. Common snowberry and Wood's rose are desirable browse for deer and elk. The small mammal community would be similar to the one in State 1 Phase 1.1. An increase in woody vegetation increases quality of

cover habitat for large and small mammals.

State 2 – Cheatgrass/ Annuals Plant Community: This state has developed due to frequent fires and improper grazing management from Phase 1.2, State 1. It also occurs with frequent fire or improper grazing management from Phase 1.3, State 1. The plant community supports harmful insects, such as grasshoppers with improved breeding conditions. The plant community supports few forbs and a very limited population of pollinators. Most reptilian species are not supported with food, water, or cover. Diversity of 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 habitat for animal species that historically used the site.

State 3 –Rangeland Seeding Plant Community: The proposed seeding mixture (native or non-native) would determine the animal species that would utilize the area. A diverse seed mixture of grasses and forbs would provide similar habitat conditions as in the herbaceous plant community described in State 1 Phase 1.3. A diverse seed mixture of grasses, forbs and shrubs would provide similar habitat conditions as described in State 1 Phase 1.1.

A monoculture of non-native grass species would not support year-long diverse populations of insects, reptiles, birds, or mammals. Animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat, and mule deer would utilize this site for nesting and/or seasonal foraging. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. 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 has high value for late spring, summer and fall grazing for cattle, sheep and horses.

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 are in hydrologic group B. When hydrologic condition of the vegetative cover is good, natural erosion hazard is slight.

Recreational uses

The site has high value for upland bird and big game hunting. The aesthetic values are good. A large variety of flora present has flowers that bloom in the spring. The site position offers an excellent view of the surrounding countryside, which is usually dissected by deep canyons. The site is popular as a hiking area because of the variety of views offered. This site often occurs adjacent to rock outcrops which harbor golden eagles and hawks which offer bird watching opportunities.

Wood products

None.

Other products

None.

Other information

Field Offices

Grangeville, ID
Lewiston, ID
Nezperce, ID
Orofino, ID
Plummer, ID
Coeur d'Alene, 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: Nez Perce 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".
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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.

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	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 are rare on this site. If rills are present they are likely to occur immediately following wildfire. Rills are most likely to occur on soils with surface textures of silt loam on slopes greater than 15%.

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, tall shrubs, and the occasional surface stone. They are not extensive.

3. **Number and height of erosional pedestals or terracettes:** Both are rare on this 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):** It may range from 10-20 percent but additional data is needed.

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

6. **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.

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):** Structure ranges from moderate fine & very fine granular to moderate thin & medium platy. Soil organic matter (SOM) ranges from 3 to 6 percent. The A or A1 horizon is typically 4 to 6 inches thick and moist color is Black.

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. Tall shrubs catch blowing snow in the interspaces.

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: perennial forbs

Other: tall shrubs

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little plant mortality and decadence is expected to occur on this site.

14. **Average percent litter cover (%) and depth (in):** Additional litter cover data is needed but is expected to be 15-30 percent to a depth of 0.1 inches. Under mature shrubs litter is >0.5 inches deep and is 90-100 percent ground cover.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Is 2500 pounds per acre (2800 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 65-75 percent of the total production, forbs 15-25 percent and shrubs 5-15 percent.

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, curlycup gumweed, St. Johnswort, leafy spurge, rush skeletonweed, dalmation toadflax, musk, yellow star and scotch thistle, and diffuse and spotted knapweed.

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