

Ecological site R010XY021ID **Stony Loam 16-22 PZ ARTRT/PSSPS**

Last updated: 9/23/2020
 Accessed: 07/27/2024

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.

Associated sites

R010XY003ID	Loamy 16-22 PZ PUTR2/FEID
R010XY004ID	South Slope Loamy 16-22 PZ ARTRX/PSSPS
R010XY005ID	North Slope Loamy 16-22 PZ ARTRV/FEID

Similar sites

R010XY009ID	Stony Loam 12-16 PZ ARTRT/PSSPS
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on undulating to very steep slopes. Slopes are generally 5 to 30 percent. Aspect is predominately south and west. Elevations range from 3500 to 4500 feet (1066-1372m).

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Flooding frequency	None
Elevation	3,500–4,500 ft
Slope	5–65%
Water table depth	60 in
Aspect	S, W

Climatic features

The elevation of MLRA 10 ranges from 1791 feet to 9236 feet, with a mean of 4602 feet. Overall, elevation increases from west to east. However, average annual precipitation decreases from west to east, ranging from 16.59 inches to 22.17 inches, with a mean of 19.56 inches, based on 7 long term climate stations throughout the MLRA. In general, precipitation peaks in December and January, with a steady decline to a low in July and August, then a steep increase during the autumn months. Most of the winter precipitation falls as snow, and maximum

annual snowfalls of up to 82 inches have been recorded.

There is considerable variation in temperature throughout the year. Temperatures as low as -52° Fahrenheit and as high as 117° Fahrenheit are on record. Some areas have recorded the occurrence of more than 50 days with temperatures above 90° Fahrenheit. The average maximum annual temperature is 63 degrees F, while the average minimum temperature is 36.2 degrees F. The frost-free period can range from 128 to 152 days, while the freeze-free period can be from 164 to 189 days.

Both the average morning and average afternoon relative humidity values are lowest in July and August, and are below the national average. The number of clear, sunny days peaks during this same period, and is higher than the national average. During the Spring and Summer months high-intensity convective thunderstorms are not unusual.

Table 3. Representative climatic features

Frost-free period (average)	152 days
Freeze-free period (average)	189 days
Precipitation total (average)	22 in

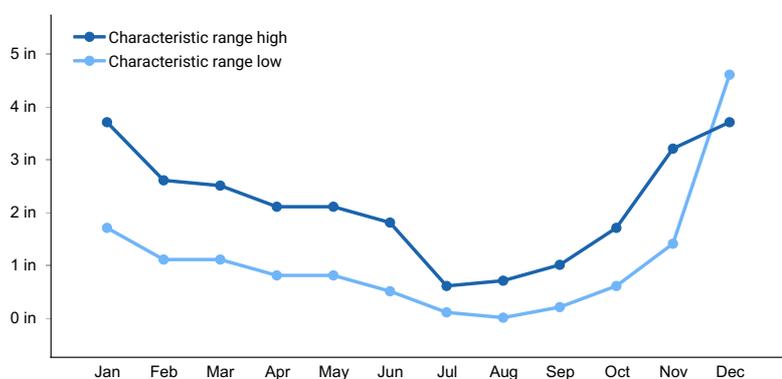


Figure 1. Monthly precipitation range

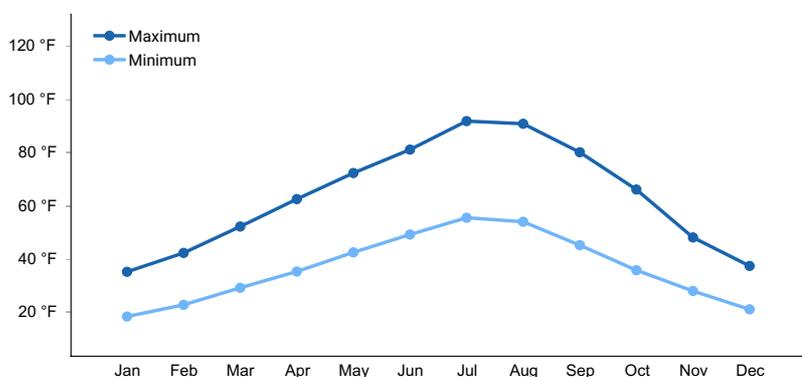


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils on this site are very deep. The soils are well drained, with moderately slow permeability. Runoff is high. The erosion hazard is moderate to severe by water. The available water capacity is low. The surface texture is very stony loam. Both the surface and subsoil are stony. These soils are characterized by a xeric soil moisture regime. Soil temperature regime is mesic.

Soil Series Correlated to this Ecological Site

Ecological dynamics

The dominant visual aspect of this site is sagebrush/ grass. Composition by weight is 60-70 percent grasses, 10-15 percent forbs and 10-20 percent shrubs.

In 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 lagomorphs and small rodents.

Fire has historically occurred on the site at intervals of 25-40 years. The Reference Plant Community Phase of this site is dominated by bluebunch wheatgrass and basin big sagebrush. Subdominant species include Idaho fescue, Nevada bluegrass, big bluegrass, bottlebrush squirreltail, arrowleaf balsamroot, tapertip hawksbeard, and antelope bitterbrush. Total annual production is 1400 pounds per acre (1568 kilograms per hectare) in a normal year. Production in a favorable year is 2100 pounds per acre (2352kilograms per hectare). Production in an unfavorable year is 800 pounds per acre (896kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are very dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted bunchgrasses are subdominant.

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. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

This site is suited for grazing by domestic livestock in late spring, early summer and fall. The site provides fair to good habitat for a variety of upland wildlife. Recreation use of this site is low due to stony soils. Due to the stony surface the site is fairly resistant to disturbances that can potentially degrade the site.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, bitterbrush increases to the point of being co-dominant with basin big sagebrush. Grasses and forbs decrease as shrubs increase

When fires become more frequent than historic levels (25-40 years), basin big sagebrush and bitterbrush are reduced significantly. With continued short fire frequency, basin big sagebrush and bitterbrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass, Idaho fescue and Nevada bluegrass. These species may be replaced by cheatgrass, Sandberg bluegrass and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Medusahead will invade on the soils with the heavier textures.

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 and possibly bitterbrush. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in basin big sagebrush and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels. If cheatgrass and/or medusahead increase due to improper grazing management and they become co-dominant with Sandberg bluegrass and other annuals, fires become more frequent.

Proper grazing management that addresses frequency, duration, and intensity of grazing over time can also keep fine fuels from developing, thereby reducing fire frequency. This reduction can lead to gradual increases in undesirable annual grasses and basin big sagebrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned, as a reduction in shrubs can increase cheatgrass and/or medusahead which will lead to more frequent fire intervals.

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 occasionally can 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. The tent caterpillar (*Malacosoma fragilis*) defoliates bitterbrush. Two consecutive years of defoliation can cause mortality in bitterbrush.

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 perennial and annual 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. Herbivory can be detrimental to bitterbrush when livestock grazing and browsing by big game occurs at the same time and season. This will occur when both kinds of animal are using the plant in the late summer or fall. The adverse impact is excessive use of the current year's leader growth.

Watershed:

Decreased infiltration and increased runoff occur with an increase in basin 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.

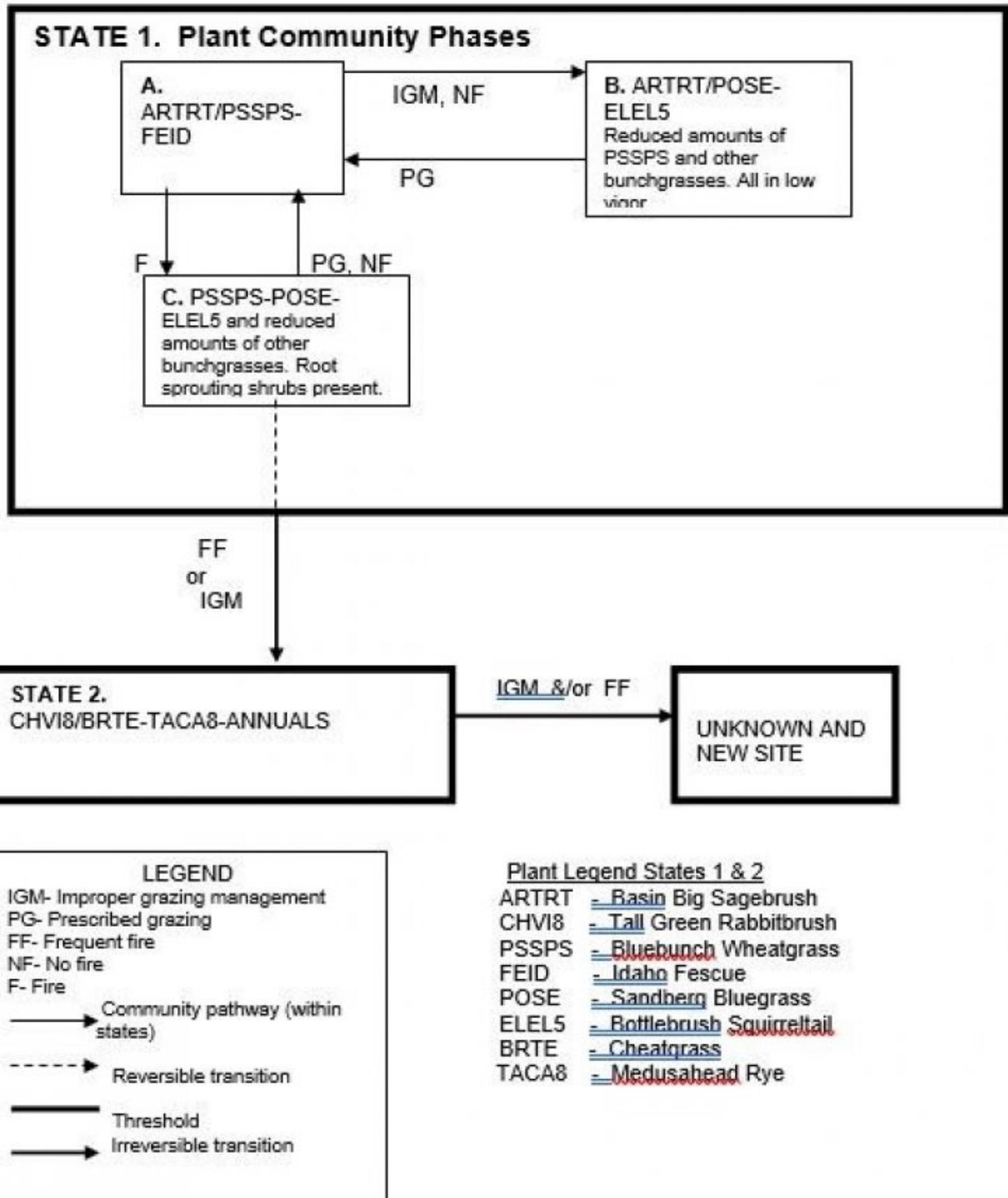
State 1 Phase C to State 2. Develops through frequent fire or continued improper grazing management. The site crosses the threshold.

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.

Practice Limitations.

Slight to severe limitations exist on this site for implementing vegetation management practices. Attaining uniform utilization on the steeper slopes is difficult. Moderate to severe limitations exist for implementing facilitating and accelerating practices due to steep slopes and stony soils.

State and transition model



**State 1
State 1 Phase A**

**Community 1.1
State 1 Phase A**

This plant community has basin big sagebrush in the overstory with bluebunch wheatgrass dominating the understory. Idaho fescue, Sandberg bluegrass, Nevada bluegrass, Columbia needlegrass, tapertip hawksbeard and arrowleaf balsamroot are sub-dominant species. Other significant species in the plant community can include lupine, penstemon, antelope bitterbrush and tall green rabbitbrush. Natural fire frequency is 25-40 years.

Table 4. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

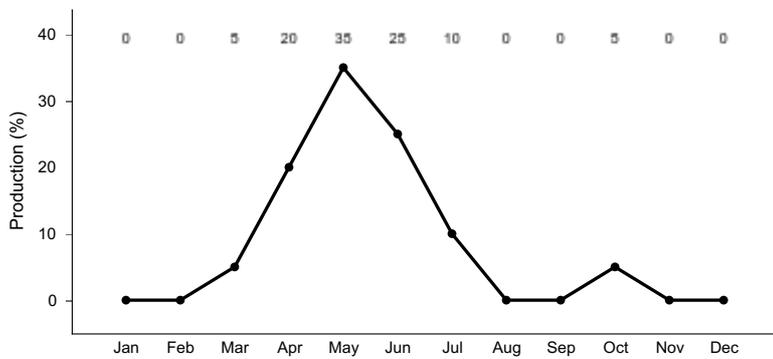


Figure 3. Plant community growth curve (percent production by month). ID0901, D25 ARTRV .

**State 2
State 1 Phase B**

**Community 2.1
State 1 Phase B**

This plant community is dominated by basin big sagebrush with reduced amounts of bluebunch wheatgrass. Bottlebrush squirreltail and Sandberg bluegrass have increased in the understory. All deep-rooted perennial bunchgrasses are typically in low vigor. Basin big sagebrush has increased. This state has developed due to improper grazing management and no fire. Some cheatgrass may have invaded the site.

Table 5. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%

Bedrock	0%
Water	0%
Bare ground	0%

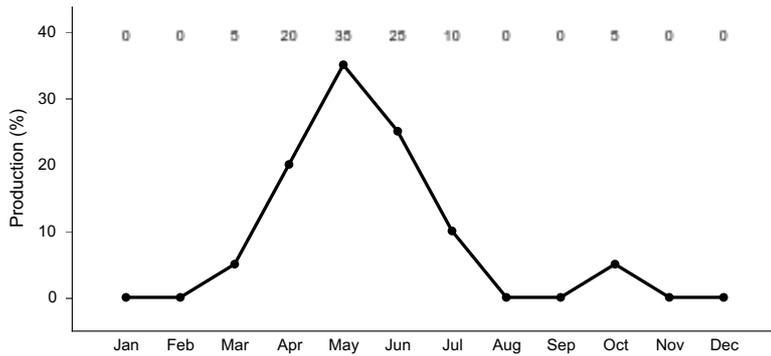


Figure 4. Plant community growth curve (percent production by month). ID0901, D25 ARTRV .

State 3
State 1 Phase C

Community 3.1
State 1 Phase C

This plant community is dominated by bluebunch wheatgrass, Sandberg bluegrass and bottlebrush squirreltail . Nevada bluegrass, the Columbia needlegrass and Idaho fescue can be lost due to fire. Forbs remain about in the same proportion as Plant Community A. Very little basin big sagebrush is present due to wildfire, but some rabbitbrush, rose, snowberry and horsebrush are present due to sprouting. Some cheatgrass may have invaded the site. This plant community is the result of wildfire.

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

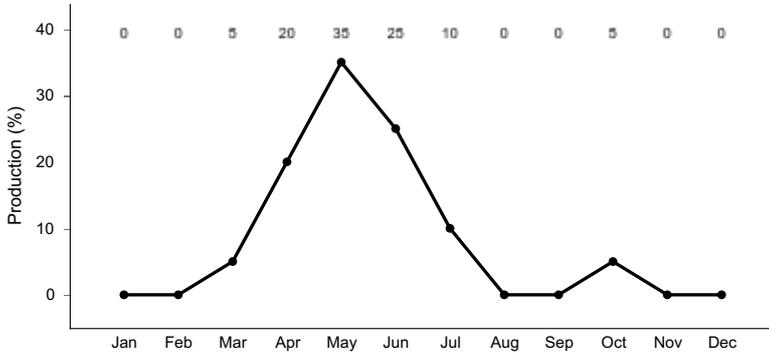


Figure 5. Plant community growth curve (percent production by month). ID0901, D25 ARTRV .

**State 4
State 2**

**Community 4.1
State 2**

This plant community is dominated by cheatgrass and other annuals. Root sprouting shrubs such as rabbitbrush and horsebrush 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. The site has crossed the threshold. It is not economically feasible to move this state back towards State 1 with accelerating practices.

Table 7. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

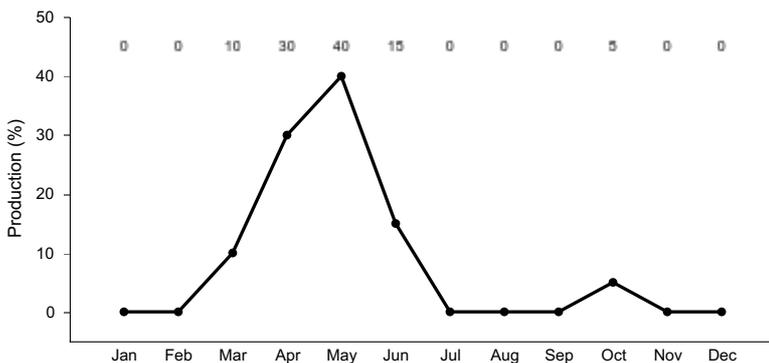


Figure 6. Plant community growth curve (percent production by month). ID0902, D25 ARTRV Early Seral.

State 5
State 3

Community 5.1
State 3

Table 8. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Additional community tables

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides diverse habitat for many native wildlife species. Large herbivore use of this ecological site is dominated by mule deer and elk. Important seasonal habitat is provided for resident and migratory animals including western toad, sagebrush lizard, western rattlesnake, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark and western meadowlark. Changes in the plant community composition can reduce the number and diversity of wildlife species in the area. With reduced shrub cover, shrub obligate avian species become rare including sage-grouse, brewer's sparrow, sage sparrow, and sage thrasher. Encroachment of noxious and invasive plant species (cheatgrass, Medusahead) 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 streams, artificial water catchments and springs.

State 1 Phase 1.1 – Basin Big Sagebrush/ Bluebunch Wheatgrass/ Idaho Fescue 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 reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western rattlesnake, western toad, boreal chorus 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 these sites by amphibians. The plant community provides habitat for prey species and cover for these resident reptiles and amphibians. Shrub-steppe obligate avian species include the Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Critical habitat (lek sites, nesting areas, winter cover and food) for sage-grouse is provided by this diverse plant community. The plant community supports the needs of large mammals (mule deer and elk) providing food and cover on a seasonal basis. Antelope bitterbrush and Idaho fescue are preferred feed for deer and elk. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots and pygmy rabbits would utilize this plant community. The deer mouse is the primary vector for planting bitterbrush seed.

State 1 Phase 1.2 – Basin Big Sagebrush/Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This state

has developed due to improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. Grasses, forbs and shrubs, are used by native insects that assist in pollination but the reduced herbaceous understory results in less diversity and numbers of insects. The reptile community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink and western rattlesnake. Diversity and populations of the reptile community would decline due to a reduced understory and associated loss of invertebrate habitat. Spring developments that capture all available water would preclude the use of these sites by amphibians. Key shrub-steppe obligate avians include Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Critical habitat (lek sites, nesting areas, winter cover and food) for sage grouse is limited due to a less diverse herbaceous plant community. The plant community supports the needs of large mammals (mule deer and elk) providing food and cover on a seasonal basis. Antelope bitterbrush is preferred browse for mule deer. The deer mouse is the primary vector for planting bitterbrush seed. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, deer mouse, pygmy rabbits and yellow-bellied marmots would utilize the habitat.

State 1 Phase 1.3 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure for wildlife. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators, and an increase in rabbitbrush would provide fall pollinator habitat. Reptile use including short horned lizard, sagebrush lizard and western rattlesnakes, would be limited or excluded due to the absence of sagebrush. The dominance of herbaceous vegetation and little or no sagebrush canopy cover would reduce or eliminate use of these areas for nesting by Brewer's sparrow, sage sparrow, sage thrasher, and sage grouse. This plant community provides limited brood-rearing habitat for sage-grouse when sagebrush cover is adjacent to the site. Sage-grouse would not use the area for wintering habitat. The dominance of herbaceous vegetation improves habitat for grassland avian species (horned lark, savannah sparrow and western meadowlark). Large mammal (mule deer and elk) forage use would be seasonal and the site would offer little thermal cover and young of year cover. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel. The site would not provide habitat for the pygmy rabbit.

State 2 –Green Rabbitbrush/ Cheatgrass/ Medusahead Plant Community: This plant community is the result of continued improper grazing management and/or frequent fire. The plant community would not support a diverse insect community. The annual forbs component in the plant community would support a very limited population of pollinators although an increase in rabbitbrush would provide fall pollinator habitat. Most native reptilian species are not supported with food, water or cover and would be absent from this site. This plant community does not support the habitat requirements for sage-grouse, sage thrasher, Brewer's sparrow or sage sparrow. 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 mammals 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 mammals would not regularly utilize these areas due to poor food and cover conditions. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

Grazing Interpretations.

This site is best suited for grazing by domestic livestock in late spring, early 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

The soils in this site are in hydrologic group C. They have moderately high to high run-off potential.

Recreational uses

Only slight values exist on this site for recreational or aesthetic values.

Wood products

None

Other products

None

Other information

Field Offices

Weiser, ID
Emmett, ID
Mountain Home,
Meridian, ID
Cascade, 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, Rangeland Management Specialist, IASCD
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Rangeland Management Specialist, IASCD

Other references

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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	03/26/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** can occur 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 and clay loam.

2. **Presence of water flow patterns:** occur on this site. When they occur, they are short and disrupted by cool season grasses, tall shrubs and surface stones. They are not extensive. Gravelly to stony surface texture interrupts flows.

3. **Number and height of erosional pedestals or terracettes:** occur on this site but are not extensive. In areas where flow patterns and/or rills are present, a few pedestals may be expected. A few terracettes may also occur on the site uphill from bases of tall shrubs, large bunchgrasses and surface stones.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** may range from 15-30 percent.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** 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 3 feet following a significant run-off event. Coarse litter generally does not move. Stones on the surface help reduce fine litter movement.

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

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** the A or A1 horizon is typically 5 inches thick. Structure ranges from weak fine granular to weak fine subangular blocky. Soil organic matter (SOM) ranges from 2 to 4 percent.

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

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** basin big sagebrush and antelope bitterbrush will become decadent in the absence of normal fire frequency and ungulate grazing. Grass and forb mortality will occur as tall shrubs increase.

14. **Average percent litter cover (%) and depth (in):** additional litter cover data is needed but is expected to be 15-20 percent to a depth of 0.1 inches. Under mature shrubs litter is >0.5 inches deep and is 90-100 percent ground cover.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 1400 pounds per acre (1568 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 60-70 percent of the total production, forbs 10-15 percent and shrubs 10-20 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:** include cheatgrass, medusahead , bulbous bluegrass, rush skeletonweed, musk and scotch thistle and diffuse and spotted knapweed.

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