

Ecological site R011XY018ID South Slope Granitic 8-12 PZ ARTRT/PSSPS

Last updated: 4/06/2020
Accessed: 05/11/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 011X–Snake River Plains

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Precipitation or Climate Zone: 8-12" P.Z.

Classification relationships

Artemisia tridentata/ *Agropyron spicatum* HT in "Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Glass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number "35."

Land Resource Region: B (Northwest Wheat and Range)
MLRA: 11 (Snake River Plains)
EPA Eco Region: Level III (Snake River Plain)

Ecological site concept

Site does not receive additional moisture

Soils are:

Not saline or saline sodic

Shallow to bedrock, with >35% coarse fragments (by volume). skeletal
not strongly or violently effervescent in the surface mineral 10"

Textures range from sandy loam to loam in the surface mineral 4"

Slope is >30%

Clay content is =<35% in surface mineral 4"

Site does not have an argillic horizon with >35% clay

Associated sites

R011XY001ID	Loamy 8-12 PZ
R011XY004ID	Shallow Loamy 8-12 PZ
R011XY005ID	Stony 10-12 PZ
R011XY008ID	South Slope 10-12 PZ
R011XY011ID	Sand 8-12 PZ ARTRT/ACHY

Similar sites

R011XY008ID	South Slope 10-12 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 steep to very steep south and west facing slopes greater than 30 percent. Elevations range from 2000 to 3000 feet (600-950 meters).

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan
Flooding frequency	None
Elevation	2,000–3,000 ft
Slope	30%
Water table depth	60 in
Aspect	S, W

Climatic features

MLRA 11 is part of Idaho’s Snake River Plain. The elevation ranges from 2,077 to 7,549 feet, with a mean of 3,992 feet. Most of the precipitation falls as rain in the fall, winter and spring. Very little precipitation occurs during the summer months. In general this MLRA receives more sun than the U.S. average during the summer, but less than average during the winter.

The average annual precipitation is 10.01 inches (based on 10 long term climate stations located throughout the MLRA), with minimum and maximum values of 8.38 and 11.62 inches, respectively.

The average annual temperature ranges from 38° to 65° Fahrenheit. With a maximum average temperature of 65 degrees F. and a minimum average of 38 degrees F. The frost free interval ranges from 139 to 165 days and the freeze free interval ranges from 168 to 196 days.

Table 3. Representative climatic features

Frost-free period (average)	165 days
Freeze-free period (average)	196 days
Precipitation total (average)	12 in

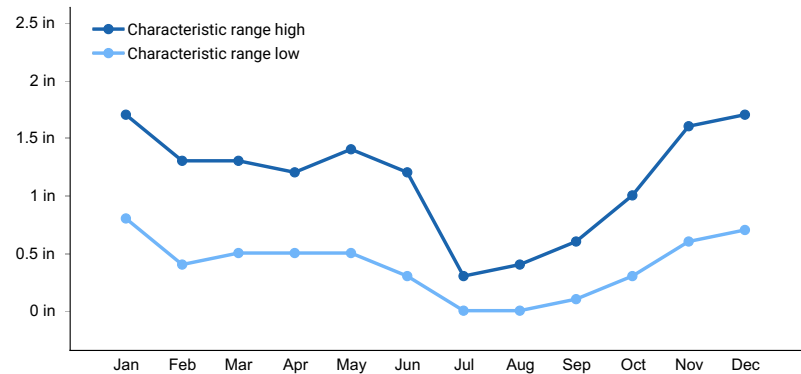


Figure 1. Monthly precipitation range

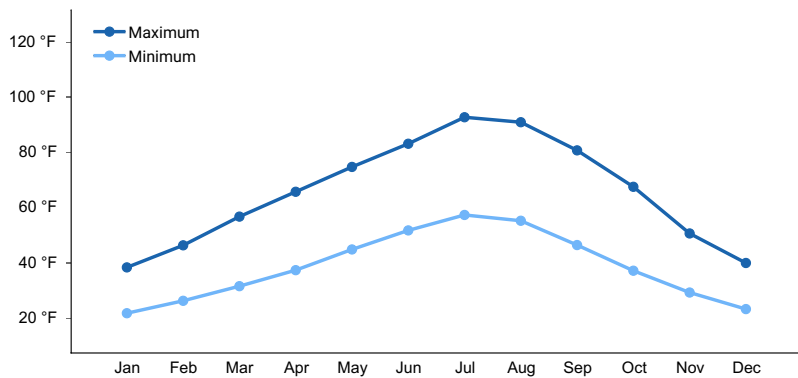


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils on this site are generally very coarse phases of sandy loam or gravelly sandy loam textures derived from granitic or other acid igneous parent material and over 20 inches (50cm) deep. The available water holding capacity (AWC) is very low to low.

The soils supporting this site are shallow over bedrock (Borid and Dobson) or very deep (Lolalita and Payette), well drained with slow to moderately rapid permeability. Runoff is medium. The erosion hazard is severe or very severe by water. The surface texture is sandy loam. Gravels and stones may be present throughout the profile but generally do not affect kind and amount of vegetation on the site. Soils generally have rapid warm-up in spring and remain warm throughout the summer due to slope position and aspect. These soils are characterized by a xeric or aridic soil moisture regime that borders on xeric. Soil temperature regime is mesic.

Soil Series Correlated to this Ecological Site

Borid
Dobson
Lolalita
Payette

Table 4. Representative soil features

Surface texture	(1) Fine gravelly sandy loam (2) Coarse sandy loam (3) Loam
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	10–60 in
Surface fragment cover ≤3"	0–30%
Surface fragment cover >3"	0–20%
Available water capacity (0–40in)	0.8–5.6 in
Soil reaction (1:1 water) (0–40in)	6.1–8.4

Subsurface fragment volume <=3" (Depth not specified)	0–50%
Subsurface fragment volume >3" (Depth not specified)	0–25%

Ecological dynamics

The dominant visual aspect of this site is bluebunch wheatgrass in the understory with basin big sagebrush in the overstory. Composition by weight is approximately 55-65% grass, 15-20% forbs, and 20-30% shrubs.

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

Fire has historically occurred on the site at intervals of 80-100 years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass in the understory and basin big sagebrush in the overstory. Bitterbrush and foothills big sagebrush are usually present. Subdominant species include Indian ricegrass, needle and thread, arrowleaf balsamroot, and tapertip hawksbeard. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 300 pounds per acre (336 kilograms per hectare) in a normal year. Production in a favorable year is 500 pounds per acre (560 kilograms per hectare). Production in an unfavorable year is 150 pounds per acre (168 kilograms 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 perennial bunchgrasses are subdominant.

FUNCTION:

This site is most suitable for spring grazing by domestic livestock. 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, raptors, and other small wildlife species. The site is often key range for mule deer in summer, fall, and winter.

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

This site provides recreational opportunities for hunting, hiking, photography, bicycling, and horseback riding.

Impacts on the Plant Community

Influence of fire:

In the absence of normal fire frequency, bitterbrush and foothills big sagebrush 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 (80-100 years), basin big sagebrush, foothills 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. These species may be replaced by Fendler threeawn, cheatgrass, Sandberg bluegrass, 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 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, foothills big sagebrush, and noxious and invasive plants.

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

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.

Proper grazing management that addresses frequency, duration, and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in basin big sagebrush and foothills big sagebrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn.

Any brush management activities should be carefully planned due to the steepness of slopes, brush species present, and erosiveness of the soils. Any reduction in shrubs without a suitable understory of perennial grasses can lead to an increase in cheatgrass which will lead to more frequent fire intervals. When bitterbrush is present, precautions need to be taken to protect it from implemented brush management activities. Total loss of the brush species on this site can have negative impacts on wildlife species.

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 reduction in fire frequency.

Influence of insects and disease:

Outbreaks can affect vegetation health, particularly bitterbrush from western tent caterpillars (*Malacosoma fragilis*). Two consecutive years of defoliation by the tent caterpillar can cause mortality in bitterbrush. Mormon crickets and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

Influence of noxious and invasive weeds:

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. 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 years' leader growth.

The deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

Watershed:

Decreased infiltration and increased runoff occur with increases in basin big sagebrush and foothills big sagebrush. Sagebrush increases can be triggered by lack of fire, improper grazing management, and prolonged drought. The 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 in the absence of fire.

Phase A to C. Develops with fire.

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

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

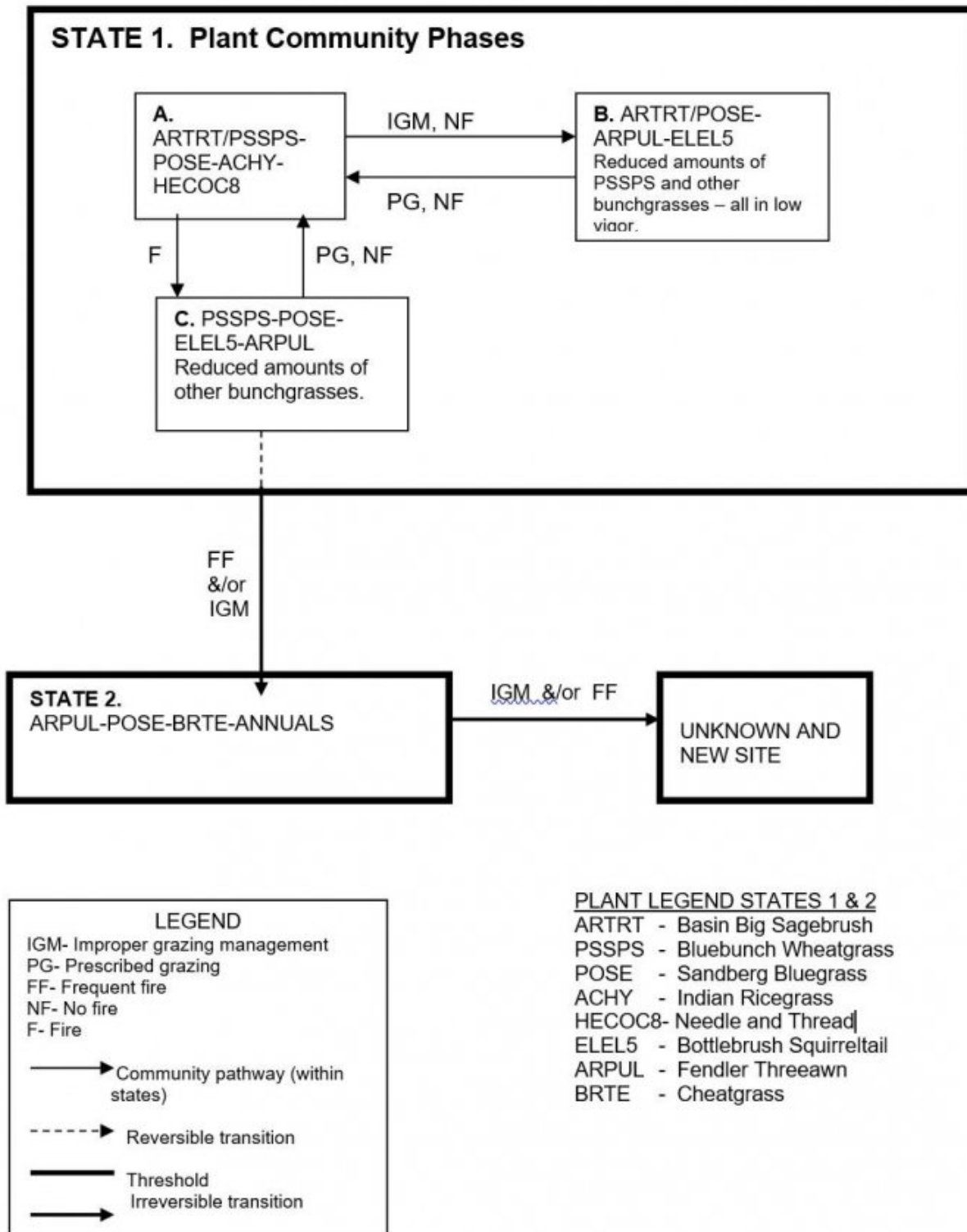
State 1 Phase C to State 2. Develops through frequent fire and/or improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

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

Practice Limitations:

Severe limitations exist for seeding and brush control using ground moving equipment due to the steepness of slopes.

State and transition model



State 1

State 1 Phase A

Community 1.1

State 1 Phase A

Reference Plant Community Phase. This plant community has basin big sagebrush in the overstory with bluebunch wheatgrass dominating the understory. Sandberg bluegrass, Indian ricegrass, needle and thread, bottlebrush squirreltail, Fendler threeawn, arrowleaf balsamroot, tapertip hawksbeard, and foothills big sagebrush are common. Natural fire frequency is 80-100 years.

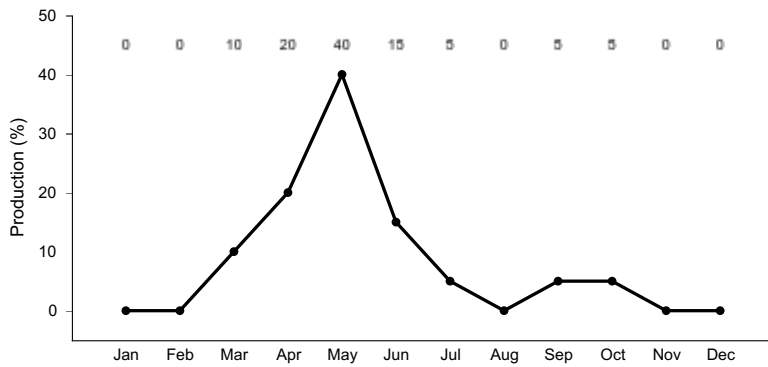


Figure 3. Plant community growth curve (percent production by month).
ID0401, KRLA2/ACHY. Reference State.

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 and other deep-rooted perennial bunchgrasses. Sandberg bluegrass, Fendler threeawn, and bottlebrush squirreltail have increased in the understory. All deep-rooted bunchgrasses are typically in low vigor. Basin big sagebrush and foothills big sagebrush have increased as well as some other tall shrubs. This state has developed due to improper grazing management and lack of fire. Some cheatgrass may have invaded the site.

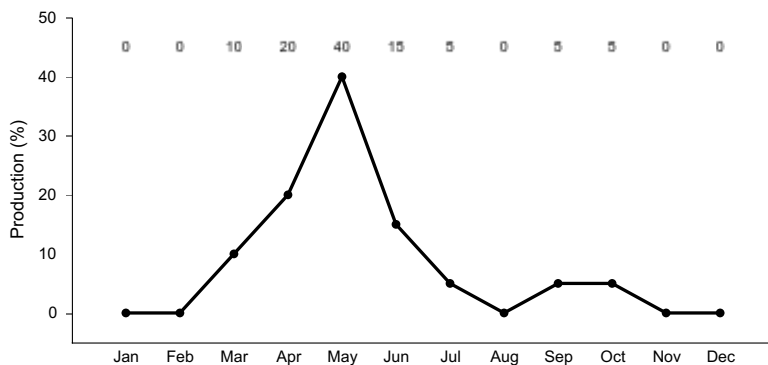


Figure 4. Plant community growth curve (percent production by month).
ID0401, KRLA2/ACHY. Reference State.

State 3

State 1 Phase C

Community 3.1

State 1 Phase C

This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass. Bottlebrush squirreltail and Fendler threeawn have increased. Forbs remain about in the same proportion as Phase A. Basin big sagebrush and foothills big sagebrush have been reduced significantly due to wildfire . Some cheatgrass may have invaded the site. This plant community is the result of wildfire.

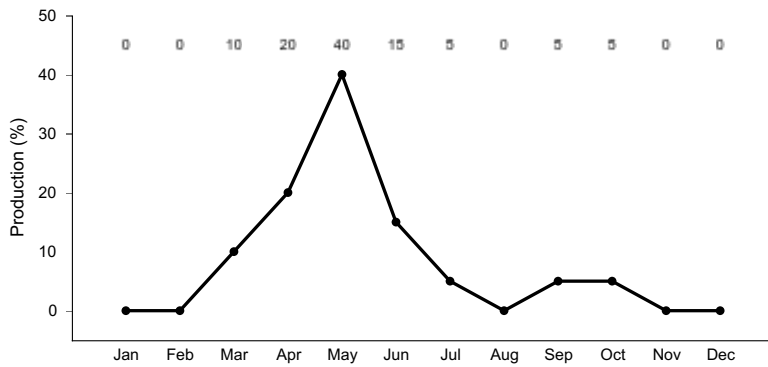


Figure 5. Plant community growth curve (percent production by month).
ID0401, KRLA2/ACHY. Reference State.

State 4 State 2

Community 4.1 State 2

This plant community is dominated by Sandberg bluegrass, cheatgrass, and other annuals. Root sprouting shrubs such as rabbitbrush and horsebrush can invade. Some soil loss has occurred. This state has developed due to frequent fires and/or improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

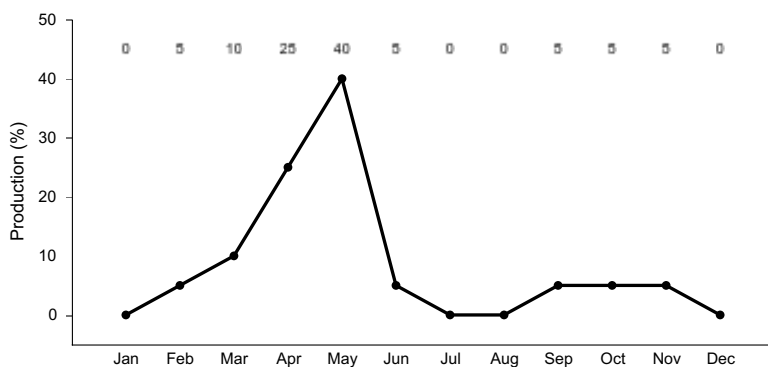


Figure 6. Plant community growth curve (percent production by month).
ID0402, POSE-BRTE/ANNUALS. State 2.

State 5 State 3

Community 5.1 State 3

Unknown new site. This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This state has developed due to continued improper grazing management and/or frequent fires. It is economically impractical to return this plant community to State 1 with accelerating practices.

Additional community tables

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides diverse habitat for many native wildlife species. The plant community

exhibits a diverse mixture of forbs throughout the growing season offering excellent habitat for invertebrates. Mule deer and elk are the large herbivores using the site. The plant community provides important spring, fall, and winter habitat for mule deer and elk. The site provides seasonal habitat for resident and migratory animals including western toad, sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Sagebrush obligate avian species include sage-grouse, Brewer's sparrow, sage sparrow, and sage thrasher. Sage-grouse, an area sensitive species, may utilize the sagebrush plant community as brood-rearing habitat and to a limited extent nesting habitat. Encroachment of noxious and invasive plant species (cheatgrass and bulbous bluegrass) in isolated areas 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/ Sandberg Bluegrass/ Indian Ricegrass/ Needle and Thread Reference Plant Community (RPC): This plant community provides a diversity of grasses, forbs, and shrubs used throughout the growing season by native insect communities that assist in pollination. Many avian and mammal species utilize this habitat based on the availability of invertebrate prey species. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, and western toad. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Native shrub-steppe obligate avian species utilizing the habitat include the Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Sage-grouse may utilize this plant community for brood-rearing habitat and to a limited extent nesting habitat. The plant community provides forage and cover for large mammals including mule deer and elk. The site can be an important wintering area for mule deer and elk where bitterbrush is present. A diverse small mammal population including golden-mantled ground squirrels, kangaroo rats, chipmunks, and yellow-bellied marmots utilize this community. Habitat for the pygmy rabbit may be present where canopy of sagebrush is high and deep soils are present. The deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

State 1 Phase 1.2 - Basin Big Sagebrush/ Sandberg Bluegrass/ Fendler Threeawn/ Bottlebrush Squirreltail Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. The reduced herbaceous understory results in reduced diversity and numbers of insects. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, and western toad. The reduction of grasses and forbs in the plant community would reduce the available prey species and cover for these resident reptile species. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collect all available water would exclude amphibian use on these sites. Key shrub-steppe obligate avians include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Quality of nesting and brood-rearing habitat for sage-grouse would decline due to poor plant vigor and lower amounts of herbaceous cover. Loss of understory vegetation, increased sagebrush density and a decline of bitterbrush, reduces forage value for mule deer and elk. Antelope bitterbrush has decreased reducing the quality of winter habitat for mule deer. A small mammal population including golden-mantled ground squirrels, kangaroo rats, chipmunks, badger, and yellow-bellied marmots would utilize this area. The deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

State 1 Phase 1.3 – Bluebunch Wheatgrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail/ Fendler Threeawn Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little to no sagebrush or antelope bitterbrush would provide less vertical structure for animals. Patches of root sprouting shrubs including rabbitbrush may be present providing limited vertical structure for wildlife. Insect diversity would be reduced but a native forb plant community as identified in State 1 Phase 1.1 would still support select pollinators. Reptiles including leopard lizard, short horned lizard, and sagebrush lizard would be limited or excluded due to the loss of sagebrush and antelope bitterbrush. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collect all available water would exclude use on this site by amphibians. The loss of sagebrush and antelope bitterbrush canopy cover would reduce the quality of this area as nesting habitat for Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. This plant community provides limited brood-rearing habitat for sage-grouse when adjacent sagebrush cover is present. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Mule deer and elk forage use would be seasonal (spring and fall) but the site would offer little thermal and young of year cover. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel. Large areas of this plant community have resulted in fragmentation of the RPC and may significantly impact native animal species dependant on the shrub component as part of their life history.

State 2 – Fendler Threeawn / Sandberg Bluegrass/ Cheatgrass / Annuals Plant Community: This plant community is the result of continued improper grazing management and/or frequent fire. Invasive herbaceous plants and patches of root sprouting shrubs like rabbitbrushes can be present. The reduced forb and shrub component in the plant community would support a very limited population of pollinators. Most reptilian species are not supported with food, water, or cover. 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 available 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 most suitable for spring grazing by domestic livestock. 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 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 C. They have moderately high runoff potential.

Recreational uses

This site provides recreational opportunities for hunting, hiking, photography, bicycling, and horseback riding.

Wood products

None

Other products

None

Other information

Field Offices

Meridian, ID

Caldwell, ID

Mountain Home, ID

Marsing, ID

Payette, ID

Weiser, ID

Emmett, 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

Dan Ogle, Acting State Rangeland Management Specialist, NRCS, Idaho
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD

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, 4/06/2020

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	04/04/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** rills can occur on this site. If rills are present they are likely to occur on slopes greater than 20 percent and immediately following wildfire. Coarse surface gravels limit rill development.
- 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 tall shrubs and are not extensive. Water infiltration is generally rapid for the site.
- Number and height of erosional pedestals or terracettes:** pedestals are rare on this site. Terracettes are common. Significant accumulation of coarse surface fragments develops on the uphill side of larger perennial grasses and shrubs.

This accumulation is from concentrated flow and hoof/ foot traffic. Terracettes are a natural occurrence on the site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** is expected to be 50-75% but more data is needed. This site is naturally unstable due to coarse surface fragments.
 5. **Number of gullies and erosion associated with gullies:** no not occur on this site.
 6. **Extent of wind scoured, blowouts and/or depositional areas:** usually not present due to coarse textured gravelly soil surface.
 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.
 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 weak very fine granular to moderate medium platy. Soil organic matter (SOM) ranges from 0.5 to 3 percent. The A or A1 horizon is typically 2 to 10 inches thick.
 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 accumulate 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

Other: perennial forbs

Additional: shallow rooted perennial bunchgrasses
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** basin big sagebrush and bitterbrush will become decadent in the absence of fire and ungulate grazing. Grass and forb mortality will occur as tall shrubs increase. Some grasses and forbs are susceptible to hoof/foot traffic.
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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. Under mature shrubs litter is >0.5 inches deep and is 90-100 percent ground cover.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 300 pounds per acre (336 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 55-65 percent of the total production, forbs 10-15 percent, and shrubs 20-30 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, leafy spurge, dalmatian toadflax, bulbous bluegrass, rush skeletonweed, musk and scotch thistle, and diffuse, Russian, and spotted knapweed.
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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in most years.
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