

## Ecological site R011XB010ID Loamy 12-16 PZ ARTRW8/PSSPS

Last updated: 4/06/2020  
Accessed: 04/19/2024

---

### 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.

### MLRA notes

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

Major Land Resource Area (MLRA): 011X – Snake River Plains  
Precipitation or Climate Zone: 12-16” P.Z.

### Classification relationships

*Atremisia wyomingensis/ Agropyron spicatum* HT in “Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35

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

Moderately deep to very deep, with <35% coarse fragments (by volume), not skeletal not strongly or violently effervescent in the surface mineral 10”

Surface textures range from silt 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

R011XA014ID	<b>Sandy 8-14 PZ ARTRT/HECOC8-ACHY</b>
R011XB007ID	<b>Loamy 12-16 PZ ARTRT/LECI4</b>

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> var. <i>wyomingensis</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>

### Physiographic features

This site occurs on nearly level to somewhat rolling lava plains and broken foothills. The site also occupies areas with slight depressions which may accumulate snow. Small lava rock outcrop areas may be scattered throughout the site. Slopes predominantly range from 0-25 percent but occasionally to 35 percent. Elevation ranges from 4000-5500 ft. (1219-1676m).

**Table 2. Representative physiographic features**

Landforms	(1) Alluvial fan (2) Lava plain
Flooding frequency	None
Ponding frequency	None
Elevation	4,000–5,500 ft
Slope	0–25%
Water table depth	60 in
Aspect	N, W

### Climatic features

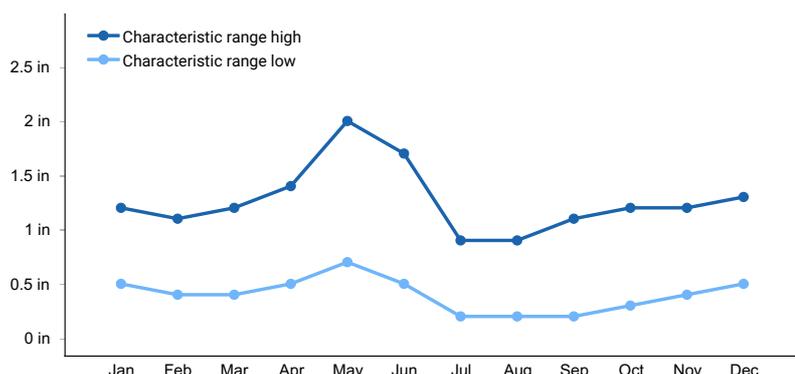
The Upper Snake River Plain, MLRA 11B, is part of the Northwestern Wheat and range Region. It has a mean elevation of 4841 feet above sea level, and varies from 4177 to 4841 feet. In general, it is a geologically young, level to gently sloping lava plateau. In places larger streams have cut deep, steep-walled canyons. The average annual precipitation, based on 10 long term climate stations located throughout the MLRA, is 10.88 inches. The averaged low is 8.74 inches and the maximum average is 12.69. Monthly precipitation usually peaks in May, then drop off rapidly to reach its low in July and August. The climate station at Aberdeen Experiment Station (1000010) has records of zero precipitation in 11 months of the year, and as low as 0.03 inches in December, the lone non-zero month.

Temperatures can be extremely variable across the year. Highs of up to 104° and lows down to -42° Fahrenheit have been recorded. The average annual temperature from ten climate stations is 44.75° F. The frost-free period ranges from 91 to 115 days. The freeze-free period can last from 123 to 146 days.

Both morning and afternoon average relative humidity values reach their low in August, and are far below the national average. Wind speed peaks in the Spring, and is generally somewhat above the national average. The average number of sunny, cloud-free days is above average for the summer months, but below average for the period from November through February. The average total snowfall is approximately 29 inches.

**Table 3. Representative climatic features**

Frost-free period (average)	115 days
Freeze-free period (average)	146 days
Precipitation total (average)	13 in



**Figure 1. Monthly precipitation range**

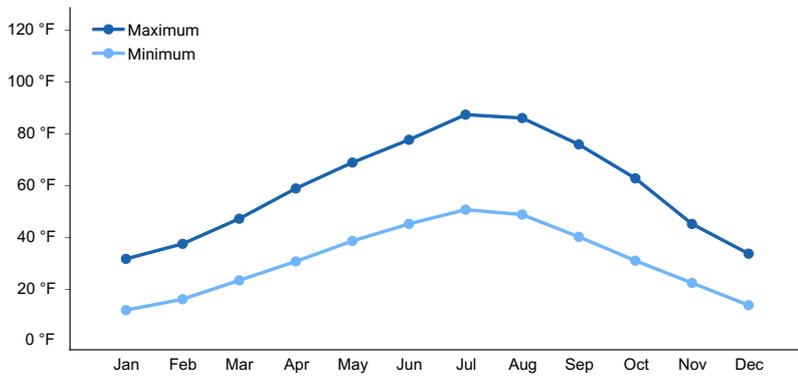


Figure 2. Monthly average minimum and maximum temperature

## Influencing water features

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

## Soil features

The soils supporting this site are moderately deep to very deep, well drained, with moderately slow permeability above the bedrock. Runoff is low to medium. The erosion hazard is slight to high by water, and slight to high by wind. The available holding water capacity (AWC) is medium to high. These soils are usually 20 inches to greater than 60 inches deep to basalt bedrock. The dark colored surface texture is generally loam or silt loam with few or no surface stones. The subsoil is usually moderately well to well developed with clay ranging from 20 to 35 percent. These soils are characterized by dark colored surfaces with lime leached to 15 inches or more. A few gravels or stones may be present but do not affect production. These soils have a xeric moisture regime and a frigid soil temperature regime.

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Loam
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	20–60 in
Surface fragment cover ≤3"	0–10%
Surface fragment cover >3"	0–3%
Available water capacity (0-40in)	4.7–7.9 in
Calcium carbonate equivalent (0-40in)	0–5%
Soil reaction (1:1 water) (0-40in)	6.1–7.8
Subsurface fragment volume ≤3" (Depth not specified)	0–30%
Subsurface fragment volume >3" (Depth not specified)	0–10%

## Ecological dynamics

Ecological Dynamics of the Site:

The dominant visual aspect of this site is bluebunch wheatgrass and Wyoming big sagebrush. Composition by weight is approximately 60-70 percent grasses, 15-25 percent forbs, and 10-20 percent shrubs.

During the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold, wet winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, and lagomorphs.

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

The Historic Climax Plant Community (HCPC) 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 HCPC is Phase A. This plant community is dominated by Wyoming big sagebrush and bluebunch wheatgrass. Subdominant species include Sandberg bluegrass, thickspike wheatgrass, bottlebrush squirreltail, Nevada bluegrass, needle and thread, tapertip hawksbeard and three-tip sagebrush. A wide variety of other grasses, forbs, and shrubs occur in small amounts. The plant species composition of Phase A is listed later under "HCPC Plant Species Composition".

Total annual production is 1000 pounds per acre (1111 kilograms per hectare) in a normal year. Production in a favorable year is 1450 pounds per acre (1624 kilograms per hectare). Production in an unfavorable year is 600 pounds per acre (666 kilograms per hectare). Structurally, cool season deep-rooted perennial bunchgrasses are dominant, followed by perennial forbs that are more dominant than shrubs followed by shallow rooted bunchgrasses.

#### FUNCTION:

This site is suited for livestock in spring, summer, and fall. If water is available, the site is easily grazed by livestock due to gentle slopes.

The site provides fair to good habitat and is used by big game animals in spring, summer, fall, and in moderate winters.

This site has limited value for recreation. Snowmobiling occurs in areas where snow accumulates.

Due to the relatively flat slopes, this site is easily degraded by improper grazing management or frequent fires.

Infiltration can be good with a mixed stand of shrubs and perennial grasses. Runoff is \_\_\_ and erosion hazard is slight. Snow is caught in the shrub interspaces and a mixed stand of shrubs and perennial grasses is necessary to reach the potential of the site.

#### Impacts on the Plant Community.

##### Influence of fire:

In the absence of normal fire frequency, Wyoming big sagebrush can gradually increase. Grasses and forbs decrease as shrubs increase.

When fires become more frequent than historic levels (25-40 years), Wyoming big sagebrush is reduced significantly. With continued short fire frequency, Wyoming big sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass, bottlebrush squirreltail, Nevada bluegrass, and needle and thread. These species may be replaced by cheatgrass along with a variety of annual and perennial forbs including invasive plants. Sandberg bluegrass usually is maintained in the community.

Three-tip sagebrush exhibits variable sprouting abilities following fire. The specific response may depend on ecotypic differences, fire severity, soil moisture or a combination of these factors.

Generally, it re-sprouts vigorously after fire. Three-tip sagebrush sprouts from shallow lateral roots or the root crown. It can also layer. Nearly pure stands can develop after the site burns.

In the absence of normal fire frequency three-tip sagebrush can gradually increase on the site. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, these shrubs can displace many of the primary understory species.

Influence of improper grazing management.

Season-long grazing and/or excessive grazing 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 an increase in Wyoming big sagebrush and three-tip sagebrush (when present) and noxious and invasive plants.

Continued improper grazing management influences fire frequency with an increase in fine fuels. As cheatgrass increases along with other annuals, fires become more frequent.

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. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. If three-tip sagebrush is present, prescribed burns can be very risky because of three-tips sprouting characteristics. Any type of brush management program should be carefully planned as a reduction in shrubs without a suitable understory of perennial grasses can lead to increases in cheatgrass which will then 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 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 precipitation. An early, hard freeze can occasionally kill some plants.

Prolonged drought adversely affects this plant community in several ways. Vigor, recruitment, and production are usually reduced. Mortality can occur. Prolonged drought can lead to a reduction in fire frequency.

Influence of insects and disease:

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

Many of these species add to the fine-fuel component and lead to increased fire frequency. Many of the annual and perennial invasive species with deep root systems compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

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

Watershed:

Decreased infiltration and increased runoff occur with the increase in Wyoming big sagebrush. Desired understory species can be reduced. The increased runoff also causes sheet and rill erosion. This composition change can affect nutrient and water cycles. 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 or improper grazing management. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

State 2 to State 3. Results from range seeding.

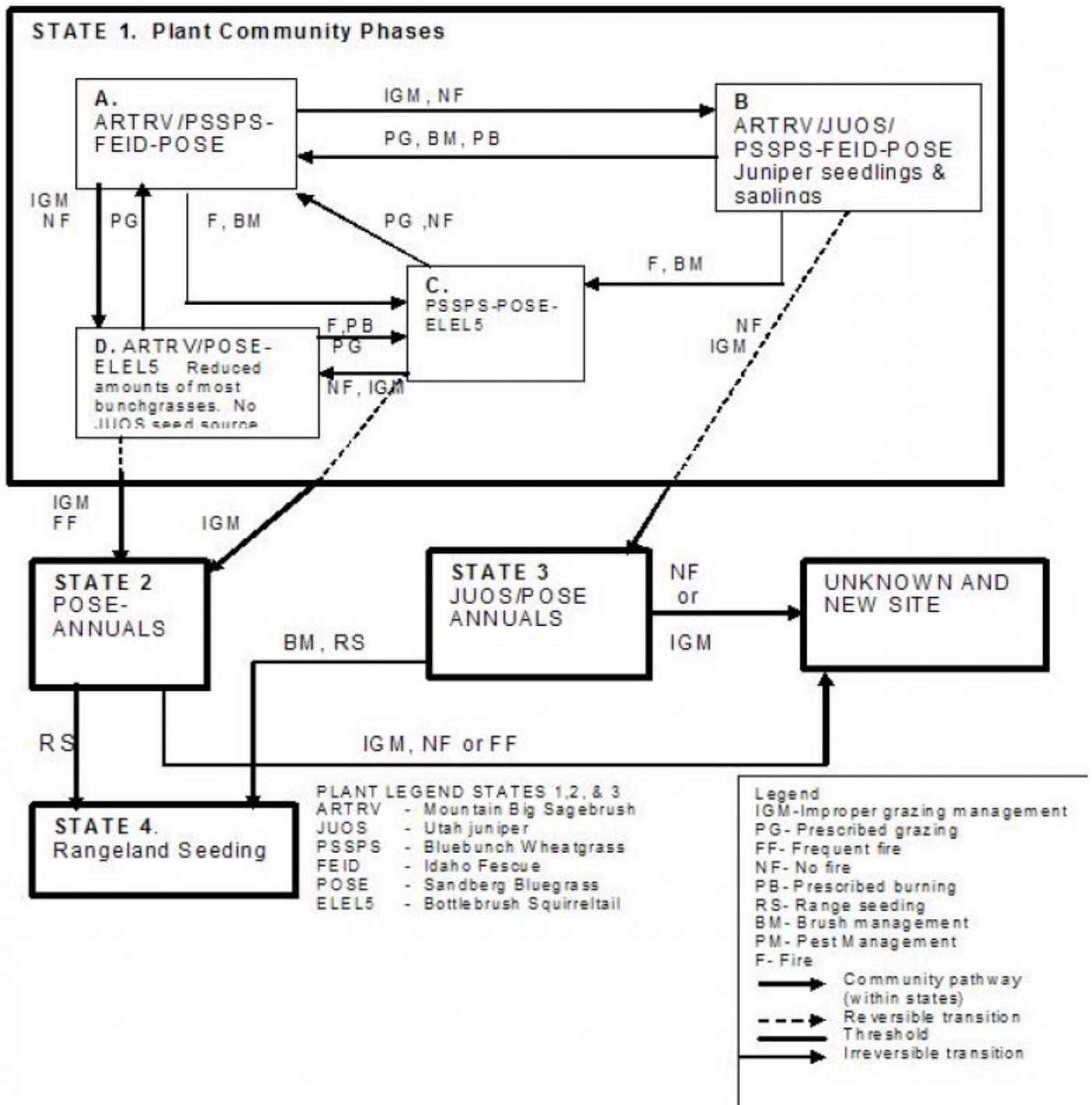
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fire cause this state to cross a threshold and retrogress to a new site with reduced potential. It is economically impractical to return this state to State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

Practice Limitations.

Only slight limitations exist on this site for implementing vegetative management practices. Usually this site is a key area for livestock management due to flatter slopes and non-stony soils. This site is suited to seeding if needed. Mechanical and chemical methods are satisfactory ways for brush management on this site. Fire should be used with caution due to the general sprouting habit of three-tip sagebrush and rabbitbrush.

**State and transition model**

The Reference State (State 1), the Historic Climax Plant Community (HCPC), moves through many phases depending on the natural and man-made forces that impact the community over time. The Reference Plant Community Phase is Phase A, State 1. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".



## State 1

State 1, Plant community A. Historic Climax Plant Community (HCPC).

### Community 1.1

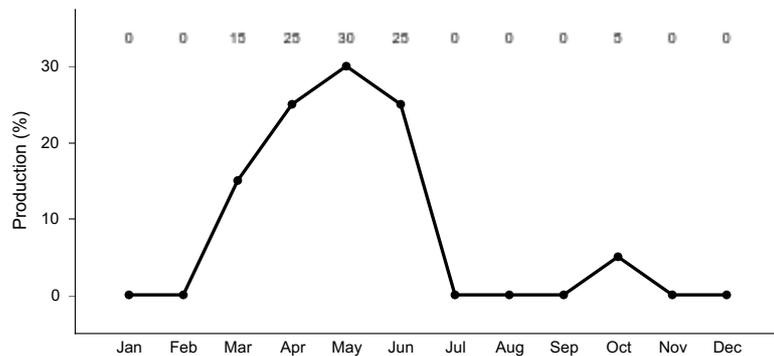
State 1, Plant community A. Historic Climax Plant Community (HCPC).

The HCPC has Wyoming big sagebrush in the overstory with bluebunch wheatgrass dominating the understory. Sandberg bluegrass, thickspike wheatgrass, Nevada bluegrass, needle and thread, and tapertip hawksbeard are sub-dominant species. Three-tip sagebrush may be present in varying amounts. There is a wide variety of other

grasses, forbs, and shrubs that occur in the plant community in small amounts. Natural fire frequency is 25-40 years.

**Table 5. Annual production by plant type**

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	390	650	950
Forb	120	200	290
Shrub/Vine	90	150	210
<b>Total</b>	<b>600</b>	<b>1000</b>	<b>1450</b>



**Figure 4. Plant community growth curve (percent production by month). ID0605, ARTRW8 -PSSPS . State 1.**

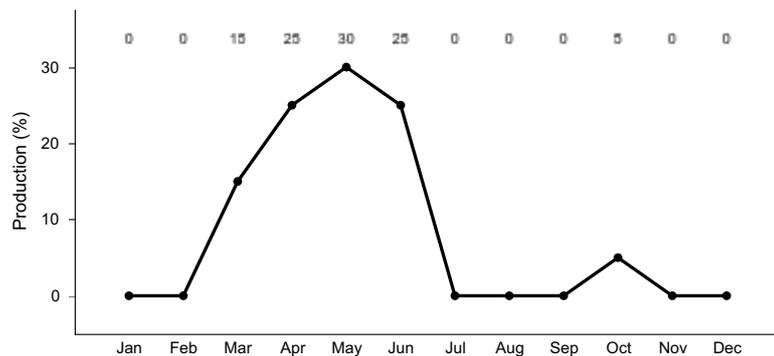
## State 2

### State 1, Plant community B

#### Community 2.1

##### State 1, Plant community B

This plant community is dominated by Wyoming big sagebrush with Sandberg bluegrass in the understory. This state has developed due to improper grazing management and lack of fire. There is a reduced amount of bluebunch wheatgrass, needle and thread, Nevada bluegrass, and other bunchgrasses. These deep-rooted perennial bunchgrasses are typically in low vigor. Tall shrubs such as three-tip sagebrush and rabbitbrush have increased.



**Figure 5. Plant community growth curve (percent production by month). ID0605, ARTRW8 -PSSPS . State 1.**

## State 3

### State 1, Plant community C

#### Community 3.1

##### State 1, Plant community C

This plant community is dominated by bluebunch wheatgrass, Sandberg bluegrass, and bottlebrush squirreltail.

Forbs remain about in the same proportion as Plant Community A. Small amounts of Wyoming sagebrush are present due to wildfire, but some rabbitbrush, three-tip sagebrush and gray horsebrush are present due to sprouting and may have increased. This plant community is the result of wildfire.

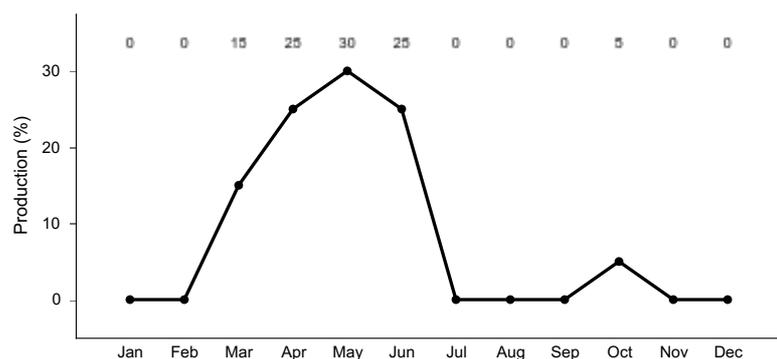


Figure 6. Plant community growth curve (percent production by month). ID0605, ARTRW8 -PSSPS . State 1.

**State 4**  
**State 2**

**Community 4.1**  
**State 2**

This plant community is dominated by Sandberg bluegrass, cheatgrass, bulbous bluegrass, and annuals. Root sprouting shrubs such as three-tip sagebrush, rabbitbrush, and horsebrush can be present, dependent upon, how frequent, fire has occurred. This state has developed due to frequent fires or improper grazing management. Some soil loss has occurred. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

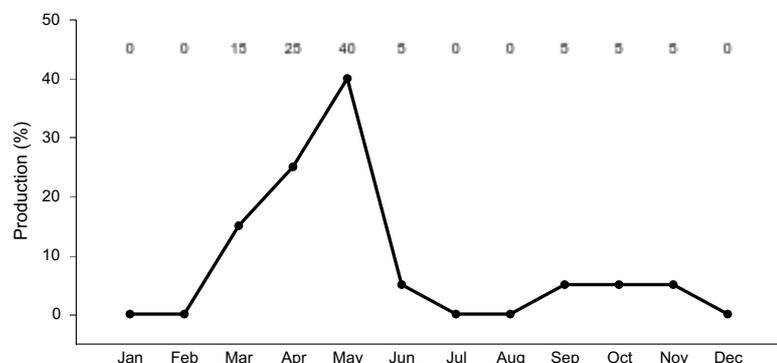


Figure 7. Plant community growth curve (percent production by month). ID0611, POSE/ BRTE/ ANNUALS . State 2.

**State 5**  
**State 3**

**Community 5.1**  
**State 3**

This plant community is dominated by the seeded species. The seeding can be introduced species or native species that attempt to mimic State 1. This community is the result of range seeding.

**State 6**  
**Unknown new site**

**Community 6.1**  
**Unknown new site**

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

## **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, pronghorn antelope, 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. Area sensitive species include pygmy rabbit, burrowing owl, great basin ground squirrel, and Townsend pocket gopher. 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 and mammal species become rare including sage-grouse, brewer's sparrow, sage thrasher, sage sparrow, and pygmy rabbits. Encroachment of noxious and invasive plant species (cheatgrass, Rush skeleton weed, and knapweed) can replace native plant species which provide critical feed, brood-rearing, and nesting cover for a variety of native wildlife. The loss of herbaceous understory vegetation has a negative impact on ground nesting birds, while the loss of shrub cover negatively affects both ground and shrub nesting avians. Water features are sparse provided by seasonal streams, artificial water catchments, and springs. This ecological site can be associated with pre-historic lava flows which provide unique cave habitats for several sensitive animal species, including the Blind Cave Leiodid Beetle, Cave Obligate Mite, Bats, and the Cave Obligate Harvestman.

State 1 Phase 1.1 - Wyoming Big Sagebrush/ Bluebunch Wheatgrass/ Sandberg Bluegrass/ Three-tip Sagebrush 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. Shrub-steppe obligate avian species include the Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Habitat (lek sites, nesting areas, winter cover, and food) for sage-grouse is provided by this diverse plant community. The plant community supports seasonal (spring through early winter) needs of large mammals (mule deer, antelope, and elk) providing food and cover. Wyoming big sagebrush is preferred browse for wild ungulates. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pygmy rabbits would utilize this plant community.

State 1 Phase 1.2 - Wyoming Big Sagebrush/ Sandberg Bluegrass/ Three-tip Sagebrush/ Rabbitbrushes Plant Community: This state has developed due to improper grazing management and a lack of fire. An increase in canopy cover of three-tip sagebrush and rabbitbrush contributes to a sparse herbaceous understory. The reduction of herbaceous understory results in lower diversity in insects. Invertebrate numbers may still be high. Diversity of reptiles may decline due to less diverse habitat for prey species. Reduced herbaceous understory is a key factor in limiting the use of this site by ground nesting avian species. Predation on ground nesting birds may increase. Shrub-steppe obligate avian species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Habitat (lek sites, nesting areas, winter cover, and food) for sage-grouse is limited due to a less diverse plant community and poor vigor of the herbaceous plant community. The reduced herbaceous understory reduces the length of seasonal forage available for large mammals (mule deer, antelope, and elk). Wyoming big sagebrush is preferred browse for wild ungulates. Thermal and young of year cover for mule deer, antelope, and elk is provided. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pygmy rabbits would utilize this plant community.

State 1 Phase 1.3 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of wildfire. An increase in three-tip sagebrush may occur due to frequent fire. The plant

community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure and limits use by animals dependent on shrub cover. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators. Cave dwelling insects and mammals from adjacent habitats would be supported by this plant community. 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 with little sagebrush canopy cover would prevent 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 if cover provided by sagebrush is adjacent to the site. The site would not provide suitable winter or nesting cover for sage-grouse. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer, antelope, and elk) use for foraging would be seasonal (spring through fall) but the site would offer little thermal cover and young of year cover. Small mammal diversity would be reduced and the plant community would not provide suitable habitat for pygmy rabbits. The site has the potential to be dominated by three-tip sagebrush in the future if not managed properly. This may limit suitability of the site in the future for sage-grouse and browse for deer, antelope, and elk.

**State 2 - Sandberg Bluegrass/ Cheatgrass/ Bulbous Bluegrass/ Annuals/ Three-tip Sagebrush/ Rabbitbrushes/ Horsebrush Plant Community:** This state has developed due to frequent fires and/or improper grazing management. The site can be dominated by herbaceous vegetation with sparse shrub cover or three-tip and rabbitbrush dominated depending on the past management and frequency of fire. The loss of the shrub component and native herbaceous plant community would not support a diverse insect community. The reduced forb component in the plant community would support a very limited population of pollinators. Most native 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 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.

**State 3 - Range Seeding Plant Community:** The seeding mixture (native or non-native) determines the animal species that utilize this site. 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 or 1.2. A monoculture of non-native grass species would not support diverse populations of insects, reptiles, birds, mammals, or sagebrush obligate species. Grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat, and elk would utilize this site for nesting and/or foraging. Birds of prey including hawks and falcons may range throughout this community looking for prey species.

#### Grazing Interpretations.

This site is suited for livestock in spring, summer, and fall. If water is available the site is easily grazed by livestock due to gentle 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**

Soils on this site are in hydrologic group B.

### **Recreational uses**

This site has limited value for recreation. Snowmobiling occurs in areas where snow accumulates.

## Wood products

None

## Other products

None

## 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

Joe May, 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

USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.

USDA, NRCS.2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA

USDA, Forest Service, Fire Effects Information Database. 2004. [www.fs.fed.us/database](http://www.fs.fed.us/database).

USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; version 4-2005.

## Contributors

DLF

## 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.

Author(s)/participant(s)	Dave Franzen and Jacy Gibbs.
--------------------------	------------------------------

Contact for lead author	Brendan Brazee, State Range Conservationist USDA-NRCS 9173 W. Barnes Drive, Suite C Boise, ID 83709
Date	03/27/2007
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills: rarely occur on this site. If rills are present they are likely to occur on slopes over 10 percent and immediately following wildfire. They are most likely to occur on silt loam surface textures.

---

2. **Presence of water flow patterns:** Water-Flow Patterns: rarely occur on this site except on slopes greater than 10 percent. If they occur, they are short and disrupted flows. They are disrupted by cool season grasses, gravels, stones and tall shrubs and are not extensive.

---

3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes: are rare on this site. 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):** Bare Ground: data is not available. On sites in mid-seral status bare ground may range from 50-65 percent.

---

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:** Wind-Scoured, Blowouts, and/or Deposition Areas: usually not present. Immediately following wildfire some soil movement may occur on lighter textured soils. Where sagebrush has repopulated the site after a fire, remnants of past wind scour may be present.

---

7. **Amount of litter movement (describe size and distance expected to travel):** Litter Movement: 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):** Soil Surface Resistance to Erosion: values should range from 4-6 but needs to be tested.

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil Surface Loss or Degradation: the surface horizon is typically 7 to 16 inches thick. Structure typically includes weak thin and moderate thick platy and weak fine and moderate fine granular, and weak fine to medium subangular blocky. Soil

organic matter (SOM) ranges from 1 to 3 percent.

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant Community Composition and Distribution Relative to Infiltration: bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration. Tall shrubs can catch 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):** Compaction Layer: 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: Functional/ Structural Groups: cool season deep -rooted perennial bunchgrasses > perennial forbs > tall shrubs > shallow rooted grasses.

Sub-dominant:

Other:

Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant Mortality/ Decadence: Wyoming big sagebrush will become decadent in the absence of normal fire frequency. Grass and forb mortality will occur as tall shrubs increase.
- 

14. **Average percent litter cover (%) and depth ( in):** Litter Amount: additional litter cover data is needed but is expected to be 5-20 percent to a depth of 0.1 inches. Under mature shrubs litter is
- 

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual Production: is 1000 pounds per acre (1111 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 60-70 percent of the total production, forbs 15-25 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:** Invasive Plants: includes cheatgrass, *Vulpia* sp., annual mustards, Russian thistle, and yellow salsify.
-

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