

## **Ecological site R011XY005ID Stony 10-12 PZ**

Last updated: 4/06/2020  
 Accessed: 05/07/2024

---

### **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: 10-12” P.Z.

### **Classification relationships**

Artemisia 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, with >35% coarse fragments (by volume) fragment size is >3”, 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	<b>Loamy 8-12 PZ</b>
R011XY004ID	<b>Shallow Loamy 8-12 PZ</b>
R011XY005ID	<b>Stony 10-12 PZ</b>
R011XY007ID	<b>Gravelly 10-12 PZ</b>
R011XY008ID	<b>South Slope 10-12 PZ</b>
R011XY009ID	<b>Silty 7-10 PZ KRLA2/ACHY</b>
R011XY010ID	<b>Calcareous Loam 7-10 PZ ATCO-PIDE4/ACHY-ACTH7</b>
R011XY011ID	<b>Sand 8-12 PZ ARTRT/ACHY</b>

R011XY014ID	Sandy Loam 8-12 PZ ARTRW8/ACHY-HECOC8
R011XY015ID	Loamy Bottom 8-14 PZ ARTRT/LECI4

## Similar sites

R011XY004ID	Shallow Loamy 8-12 PZ
-------------	-----------------------

**Table 1. Dominant plant species**

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

## Physiographic features

This site generally occurs on nearly level to steep slopes that are predominantly 1 to 30 percent. This site is on all aspects. Elevations range from 2000 to 3500 feet (600-1100 meters). This site is associated with moderately sloping plains, foothills, and terraces.

**Table 2. Representative physiographic features**

Landforms	(1) Plain
Flooding frequency	None
Elevation	610–1,067 m
Slope	1–30%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

## Climatic features

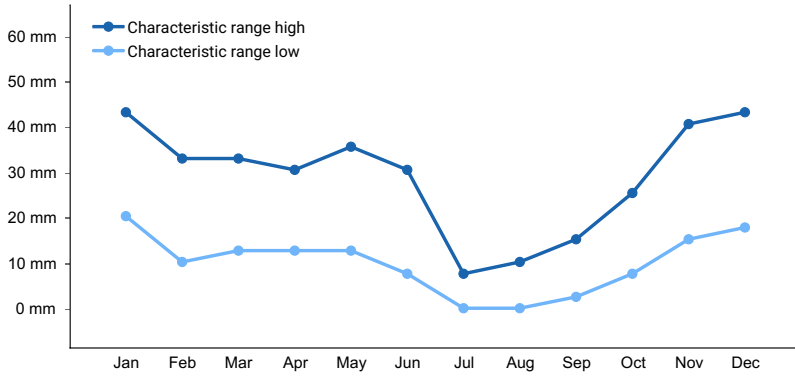
MLRA 11 is part of Idaho's Snake River Plain. The elevation ranges from 2,077 to 7,549 feet, with a mean of 3,992 feet. Most of the precipitation falls as rain in the fall, winter and spring. Very little precipitation occurs during the summer months. In general this MLRA receives more sun than the U.S.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

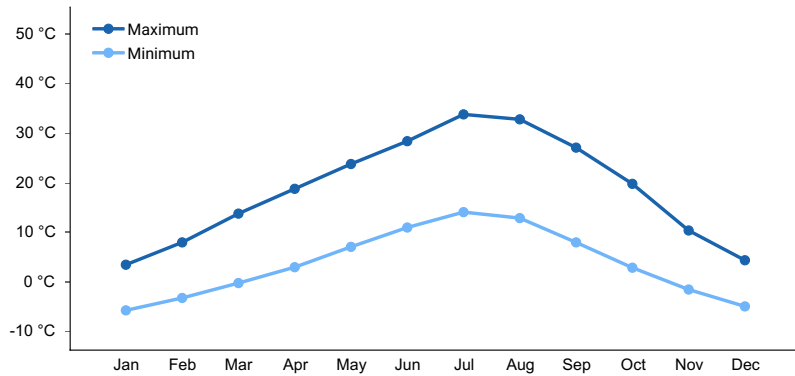
The average annual temperature ranges from 38° to 65° Fahrenheit. With a maximum average temperature of 65 degrees F. and a minimum average of 38 degrees F. The frost free interval ranges from 139 to 165 days and the freeze free interval ranges from 168 to 196 days.

**Table 3. Representative climatic features**

Frost-free period (average)	165 days
Freeze-free period (average)	196 days
Precipitation total (average)	305 mm



**Figure 1. Monthly precipitation range**



**Figure 2. Monthly average minimum and maximum temperature**

## Influencing water features

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

## Soil features

The soils supporting this site are moderately deep over bedrock. The soils are well drained and have slow to moderately slow permeability. Runoff is low to very high. The erosion hazard is slight to severe by water and slight to severe by wind. These soils have little runoff and erosion except from a few intense summer rainstorms. The available water holding capacity (AWC) is low to moderate. The surface texture is generally extremely stony silt loam. Volume of stones is sufficient to affect kind and amount of vegetation. These soils are characterized by an aridic soil moisture regime that borders on xeric. Soil temperature regime is mesic.

Soil Series Correlated to this Ecological Site

Bowns

McCain

**Table 4. Representative soil features**

Surface texture	(1) Extremely stony sandy loam (2) Loam
Drainage class	Well drained
Permeability class	Slow to moderately slow
Soil depth	51–102 cm
Surface fragment cover <=3"	0–20%
Surface fragment cover >3"	0–40%

Available water capacity (0-101.6cm)	12.7–17.27 cm
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	0–9%
Subsurface fragment volume >3" (Depth not specified)	0–17%

## Ecological dynamics

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

Fire has historically occurred on the site at intervals of 50-70 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 in the understory and Wyoming big sagebrush in the overstory. Subdominant species include Sandberg bluegrass, Thurber's needlegrass, arrowleaf balsamroot, lupine, longleaf phlox, and tapertip hawksbeard. There is a large variety of other grasses, forbs and shrubs that can occur in minor amounts. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 600 pounds per acre (672 kilograms per hectare) in a normal year. Production in a favorable year is 900 pounds per acre (1008 kilograms per hectare). Production in an unfavorable year is 400 pounds per acre (448 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 suited for livestock grazing in the spring and fall. Stones on the surface may limit livestock access. The distance to water may be a problem in some areas.

The site provides winter and spring range for mule deer and pronghorn antelope. It has some value as sage grouse brood rearing habitat.

The site has limited value for recreation but does provide some hunting, hiking, and photographic opportunities.

Due to gentle slopes and relatively low production, this site can be degraded from improper livestock management but surface stones can limit access by livestock to some degree. 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 on the site. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, Wyoming big sagebrush can displace most of the primary understory species.

When fires become more frequent than historic levels (50-70 years), Wyoming big sagebrush is reduced significantly. Rabbitbrush can increase slightly. With continued short fire frequency, Wyoming big sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass, Indian ricegrass, and Thurber's needlegrass. These species may be replaced by Sandberg bluegrass and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass will invade the site. These fine fuels will increase the fire frequency.

#### Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. This type of management leads to reduced vigor of the bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to increase in Wyoming big sagebrush and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels. As cheatgrass increases and becomes co-dominant with Sandberg bluegrass and 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 Wyoming big sagebrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Brush management should be carefully planned, as a reduction in shrubs without a suitable understory of perennial grasses can increase cheatgrass which will lead to more frequent fire intervals. If bitterbrush is present, precautions need to be taken to protect it from any brush management practices applied. Loss of bitterbrush from this site will have negative impacts on wildlife and livestock.

#### 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. Prolonged drought can lead to a reduction in fire frequency.

#### Influence of Insects and disease:

Outbreaks can affect vegetation health. The sagebrush defoliator moth (*Aroga websterii*) causes mortality in relatively small patches. It seldom kills the entire stand. 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. Annual and perennial invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

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

Watershed:

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

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 and/or continued improper grazing management. The site has crossed the threshold. It is generally not economically feasible to move this state back to State 1 with accelerated 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 generally not economically feasible to move this state back to State 1 with accelerated practices.

Practice Limitations:

Severe limitations exist on this site for seeding due to stoniness and low available water holding capacity (AWC) of the soil. Severe limitations exist on this site for brush control by ground moving equipment due to stoniness. Removal of Wyoming big sagebrush can result in a significant invasion of cheatgrass.

## **State and transition model**

# R011XY005ID – Stony 10-12 ARTRW8/PSSP6

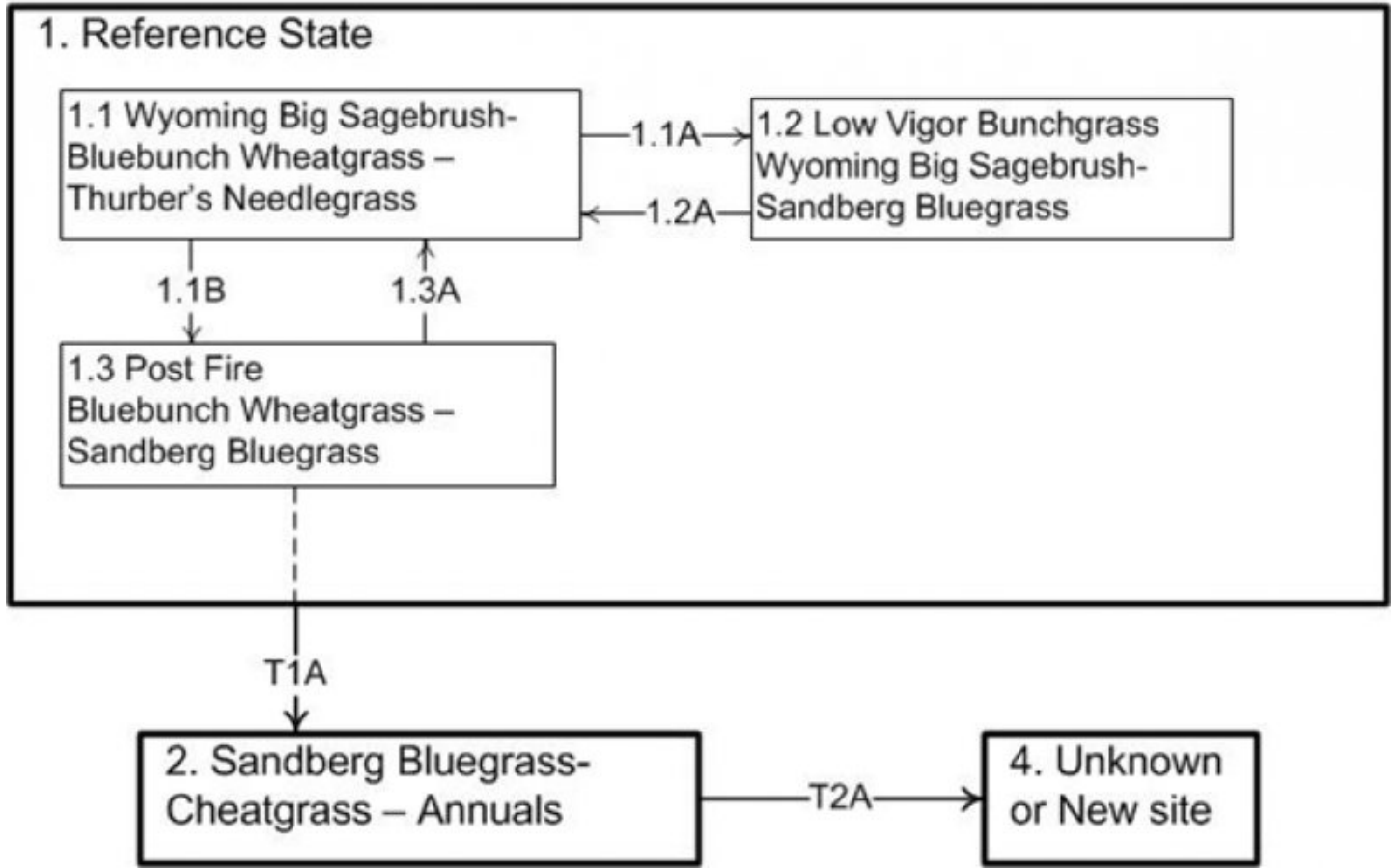


Figure 3. 11x-05

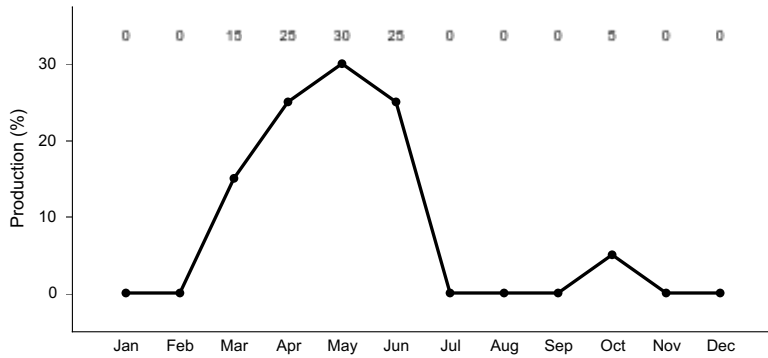
**State 1**  
**State 1 Phase A**

**Community 1.1**  
**State 1 Phase A**

This plant community has Wyoming big sagebrush in the overstory with bluebunch wheatgrass dominating the understory. Thurber’s needlegrass and Sandberg bluegrass are the subdominant grasses. Other significant species include Indian ricegrass, bottlebrush squirreltail, streambank wheatgrass, lupine, tapertip hawksbeard, longleaf phlox, and arrowleaf balsamroot. There can be a variety of other grasses, forbs, and shrubs in minor amounts. Natural fire frequency is 50-70 years.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	291	437	656
Shrub/Vine	90	135	202
Forb	67	101	151
<b>Total</b>	<b>448</b>	<b>673</b>	<b>1009</b>

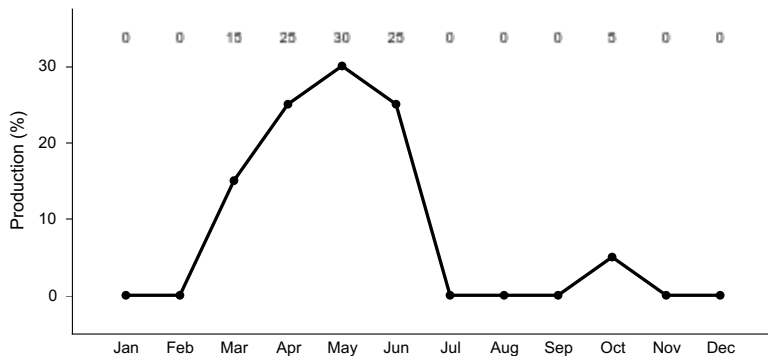


**Figure 5. Plant community growth curve (percent production by month). ID0405, PSSPS bluebunch wheatgrass ARTRT-ACHY . State 1.**

**State 2  
State 1 Phase B**

**Community 2.1  
State 1 Phase B**

This plant community is dominated by Wyoming big sagebrush with reduced amounts of bluebunch wheatgrass. Sandberg bluegrass and bottlebrush squirreltail has increased in the understory. Thurber’s needlegrass gradually decreases. There is a reduced amount of Indian ricegrass and other perennial grasses. All deep-rooted bunchgrasses are typically in low vigor. Wyoming big sagebrush has increased. This state has developed due to improper grazing management. Some cheatgrass may have invaded the site.



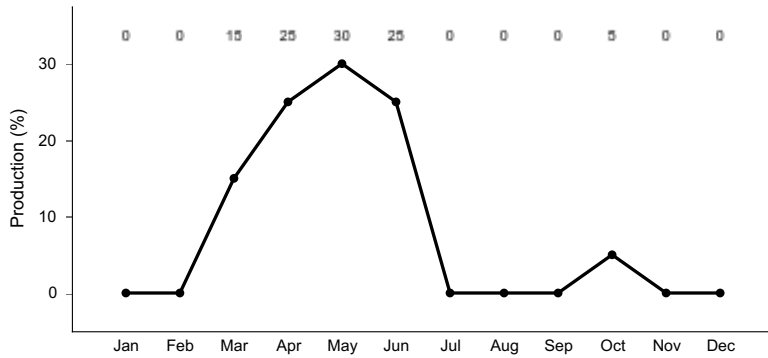
**Figure 6. Plant community growth curve (percent production by month). ID0405, PSSPS bluebunch wheatgrass ARTRT-ACHY . State 1.**

**State 3  
State 1 Phase C**

**Community 3.1  
State 1 Phase C**

This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass. Some Thurber’s needlegrass may be lost due to fire. Bottlebrush squirreltail has increased. Forbs remain about in the same proportion as Phase A. Little Wyoming sagebrush is present due to wildfire, but some rabbitbrush and horsebrush are present due to sprouting. Some cheatgrass has invaded the site. This plant community is the result of wildfire.



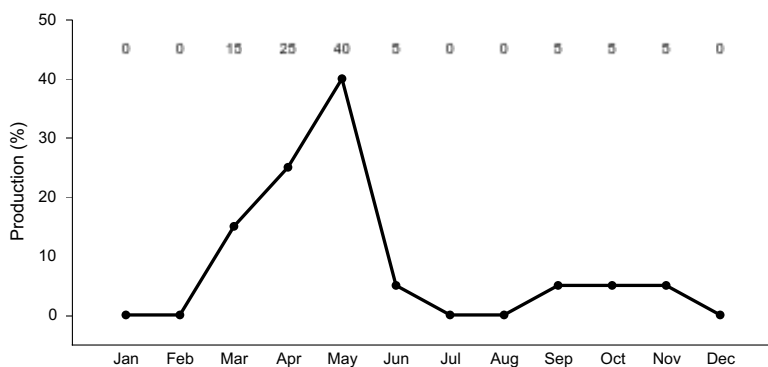


**Figure 7. Plant community growth curve (percent production by month). ID0405, PSSPS bluebunch wheatgrass ARTRT-ACHY . State 1.**

**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 be present. Some soil loss has occurred. This state has developed due to frequent fires and/or improper grazing management. The site has crossed the threshold. It is generally not economically feasible to move this state back to State 1 with accelerated practices.



**Figure 8. Plant community growth curve (percent production by month). ID0411, 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 generally not economically feasible to move this state back 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 and pronghorn antelope. 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. Encroachment of noxious and invasive plant species (cheatgrass and bulbous bluegrass) 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. This rangeland ecological site is commonly 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/ Thurber's Needlegrass/ Sandberg Bluegrass 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, and western toad. 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. Native shrub-steppe obligate avian species include the Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Critical habitat (brood-rearing and winter cover) for sage-grouse is provided by this diverse plant community. The plant community supports the seasonal needs of large mammals (mule deer and antelope) providing food and cover. Wyoming big sagebrush is preferred browse for wild ungulates. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots would utilize this plant community.

State 1 Phase 1.2 - Wyoming Big Sagebrush/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of improper grazing management. 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 lower diversity and numbers of insects which would reduce reptile diversity and populations. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Key shrub-steppe avian obligates include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Critical habitat (brood-rearing and winter cover) for sage-grouse is limited due to a less diverse herbaceous plant community. The plant community supports the seasonal needs of large mammals (mule deer and antelope) providing food and cover. Wyoming big sagebrush is preferred browse for wild ungulates. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots utilize this plant community.

State 1 Phase 1.3 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of frequent fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure and limits use by shrub obligate animals. Insect diversity would be lower but a diverse native forb plant community would still support select pollinators. 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 brood-rearing habitat for sage-grouse when sagebrush cover is nearby. The site does 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 and antelope) use for foraging would be seasonal but the site would offer little thermal and young of year cover. Small mammal diversity would be reduced, but kangaroo rat populations may increase.

State 2 - Sandberg Bluegrass/ Cheatgrass and Annual Plant Community: This plant community is the result of continued improper grazing management and/or frequent fire. The loss of the native shrub and 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 reduction of insect populations and diversity would reduce suitability of the site for bats. 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, avians, 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 to spring and fall grazing by domestic livestock. Stones may be a deterrent to livestock movement but do not exclude grazing.

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 groups B and C. When hydrologic conditions of the vegetative cover are good, natural erosion hazard is slight.

### **Recreational uses**

This site has very little recreational value particularly due to stones on surface. It does have some value for aesthetics in spring when the balsamroot, lupine, and fleabane are in bloom.

### **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 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".  
 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/feis](http://www.fs.fed.us/database/feis)  
 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

Dave Franzen And Jacy Gibbs

## 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 Intermountain Range Consultants 17700 Fargo Rd. Wilder, ID 83676
Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	04/03/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

- Number and extent of rills:** rills rarely occur on this site. If they do occur they are most likely to be on slopes greater than 15% and immediately following wildfire. Stones on the surface reduce erosion.

---

- Presence of water flow patterns:** water-flow patterns rarely occur on this site except on slopes greater than 15%.

When they do occur, they are short, disrupted by cool season perennial grasses, tall shrubs, and stones and are not extensive.

---

3. **Number and height of erosional pedestals or terracettes:** both are rare on this site. In areas of greater than 15% slopes where flow patterns and/or rills are present, a few pedestals and terracettes may be expected.

---

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** no data for bare ground but expected to range from 25-50 percent.

---

5. **Number of gullies and erosion associated with gullies:** does 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 2 feet or further following a significant run-off event. Coarse litter generally does not move.

---

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

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure ranges from moderate fine granular to moderate thick platy. Soil organic matter (SOM) is 1 or 2 percent. The A or A1 horizon is typically 2 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. Shrubs accumulate snow in the interspaces. Terracettes provide a favorable micro-site for vegetative establishment, which further increases infiltration.

---

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 grasses

---

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

14. **Average percent litter cover (%) and depth ( in):** annual litter cover in the interspaces will be 5-10 percent to a depth of <0.1". Under the mature shrubs litter is greater than 0.5 inches. Fine litter can accumulate on the terracettes.
- 

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 600 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 60-70 percent of the total, forbs 10-20 percent, and shrubs 15-25 percent.
- 

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** includes cheatgrass, bulbous bluegrass, rush skeletonweed, scotch thistle, medusahead, spotted and diffuse knapweed, Russian thistle, and annual kochia.
- 

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