

## **Ecological site R011XA014ID Sandy 8-14 PZ ARTRT/HECOC8-ACHY**

Last updated: 4/29/2024  
 Accessed: 05/08/2024

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### **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: 8-14” P.Z.

### **Classification relationships**

Artrmisia tridentata/ Stipa comata 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  
 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 loamy fine sand to loamy sand 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**

R011XA009ID	<b>Loamy 8-12 PZ ARTRT/PSSPS</b>
R011XY001ID	<b>Loamy 8-12 PZ</b>

### **Similar sites**

R011XA009ID	<b>Loamy 8-12 PZ ARTRT/PSSPS</b>
R011XY001ID	<b>Loamy 8-12 PZ</b>

**Table 1. Dominant plant species**

Tree	Not specified
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Shrub	(1) <i>Artemisia tridentata ssp. tridentata</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i> (2) <i>Hesperostipa comata</i>

## Physiographic features

This site occurs on nearly level to hilly slopes that range from 0 to 15 percent. The site occurs on all aspects and the elevations range from 3000 to 5600 feet (914-1707m). This site is associated with dunes, alluvial fans, and terraces.

**Table 2. Representative physiographic features**

Landforms	(1) Dune (2) Alluvial fan (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	914–1,707 m
Aspect	Aspect is not a significant factor

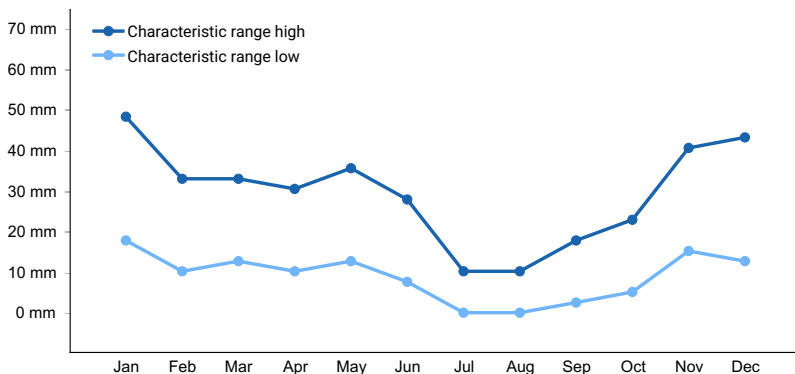
## Climatic features

The Central Snake River Plain, MLRA 11A, has a mean elevation of 3929 feet above sea level, and varies from a minimum of 2575 feet to a maximum of 8586 feet. The average annual precipitation is 10.03 inches, with a range of 8.30 to 11.46 inches, based on 10 long term climate stations located throughout the MLRA. In general, annual precipitation is below the national average, especially during the summer months. Temperatures show considerable variation during the year. A maximum temperature of 112° Fahrenheit was recorded at the Hagerman climate station (# 103932; elevation 2880 feet), and a minimum of -38° was recorded at the Richfield station. Richfield has also recorded up to 186 days below freezing during the year.

The frost-free period ranges from 116 to 140 days. The freeze-free period can be as short as 144 days to as long as 169 days. Each period is greatest on the west side of the MLRA. In general, morning and afternoon relative humidity is at or far below the national average, especially during the months of May through September.

**Table 3. Representative climatic features**

Frost-free period (average)	140 days
Freeze-free period (average)	169 days
Precipitation total (average)	279 mm



**Figure 1. Monthly precipitation range**

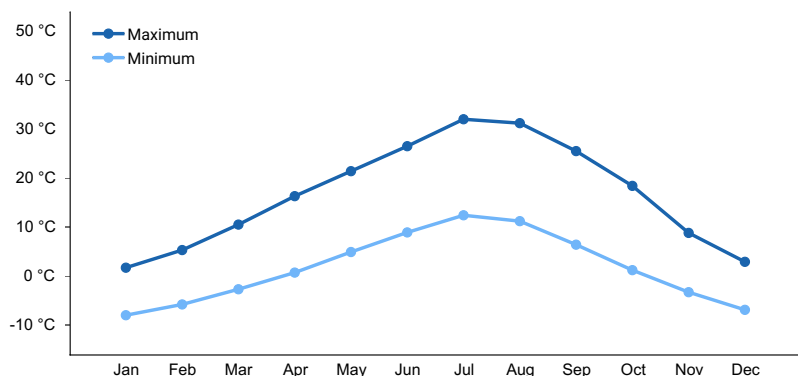


Figure 2. Monthly average minimum and maximum temperature

## 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 to very deep, well to excessively drained, with moderately slow to rapid permeability usually above bedrock or a duripan. Runoff is very low to very high. The erosion hazard is slight to severe by water and moderate to very severe by wind. Erosion hazard by wind is very severe when plant cover is scarce or lacking. The available water holding capacity (AWC) is very low to low. The surface texture is generally sandy. These soils are characterized by a xeric soil moisture regime, or aridic that borders on xeric. Soil temperature regime is mesic, Zweifel is frigid.

These are for the surface layer only. Zweifel has slow permeability. Burch has AWC max of 6.6. Zweifel has a CCE of 10 and SAR of 8.

Table 4. Representative soil features

Surface texture	(1) Stony loamy fine sand (2) Gravelly loamy sand (3) Fine sand
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	51–152 cm
Surface fragment cover ≤3"	0–11%
Surface fragment cover >3"	0–17%
Available water capacity (0-101.6cm)	2.54–14.99 cm
Calcium carbonate equivalent (0-101.6cm)	0–3%
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0–43%
Subsurface fragment volume >3" (Depth not specified)	0–43%

## Ecological dynamics

Ecological Dynamics of the Site:

The dominant visual aspect of this site is basin big sagebrush in the overstory with Indian ricegrass and needle and thread in the understory. The composition by weight is 50 to 60 percent grasses, 5 to 15 percent forbs, and 30 to 40 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 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) 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 Indian ricegrass and needle and thread in the understory and basin big sagebrush in the overstory. Subdominant species include sand dropseed, bottlebrush squirreltail, arrowleaf balsamroot, and sand scurfpea. The plant species composition of Phase A is listed later under "HCPC Plant Species Composition".

Total annual production is 750 pounds per acre (833 kilograms per hectare) in a normal year. Production in a favorable year is 1000 pounds per acre (1111 kilograms per hectare). Production in an unfavorable year is 500 pounds per acre (555 kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted perennial bunchgrasses are subdominant.

#### FUNCTION:

This site is best suited for livestock grazing in the spring, summer, and fall. There are few limitations to grazing. The distance to water may be a problem in some areas. The site is used by mule deer, pronghorn antelope, lagomorphs, small rodents, and predators. Upland game birds such as chukars also use the site as do various birds indigenous to the area. Pronghorn antelope use the site only occasionally due to the height of shrubs. This site has limited recreation use except hunting.

Due to the low production potential and easy access by animals, 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, when it does occur, is non-erosive except during high intensity convection storms. 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. If vegetative cover is removed, the potential for wind erosion is high.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, basin big sagebrush, antelope bitterbrush, Utah juniper and 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.

When fires become more frequent than historic levels (50-70 years), basin big sagebrush and antelope bitterbrush are reduced significantly. Rabbitbrush, broom snakeweed, and horsebrush can increase slightly. Three-tip sagebrush, if present, may re-sprout vigorously after burning. With continued short fire frequency, basin big sagebrush and antelope bitterbrush can be completely eliminated along with many of the desirable understory species. Cheatgrass will invade the site. Establishment of 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 basin big sagebrush, three-tip 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 basin big sagebrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned, as a reduction in shrubs without a suitable understory of perennial grasses can increase cheatgrass which leads to more frequent fire intervals.

#### Weather influences:

Above normal precipitation in March, 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:

Outbreaks can affect vegetation health. Bitterbrush can be severely affected by the western tent caterpillar (*Malacosoma fragilis*). Two consecutive years of defoliation by the tent caterpillar can cause mortality in bitterbrush. It seldom kills the entire stand. 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. Outbreaks of Black grass bugs commonly occur on basin wildrye and the wheatgrasses. They seldom kill the plants but do reduce vigor and affect the palatability for grazing animals.

#### Influence of noxious and invasive plants:

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

#### Influence of wildlife:

Big game animals use this site in the spring, summer, and fall and in moderate winters. Their numbers are seldom high enough to adversely affect the plant community. Burrowing rodents can create microsites for establishment of noxious and invasive species.

#### Watershed:

Decreased infiltration and increased runoff occur with an increase in basin big sagebrush. Desired understory species can be reduced. This composition change can affect nutrient and water cycles. Increased runoff also causes sheet and rill erosion. Abnormally short fire frequency also gives the same results, but to a lesser degree. The long-term effect is a transition to a different state.

#### Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.

Phase A to B. Develops with improper grazing management and 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 not economically practical to return this plant community to State 1 with accelerating practices.

State 2 to 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 not economically practical to return this plant community to State 1 with accelerating practices.

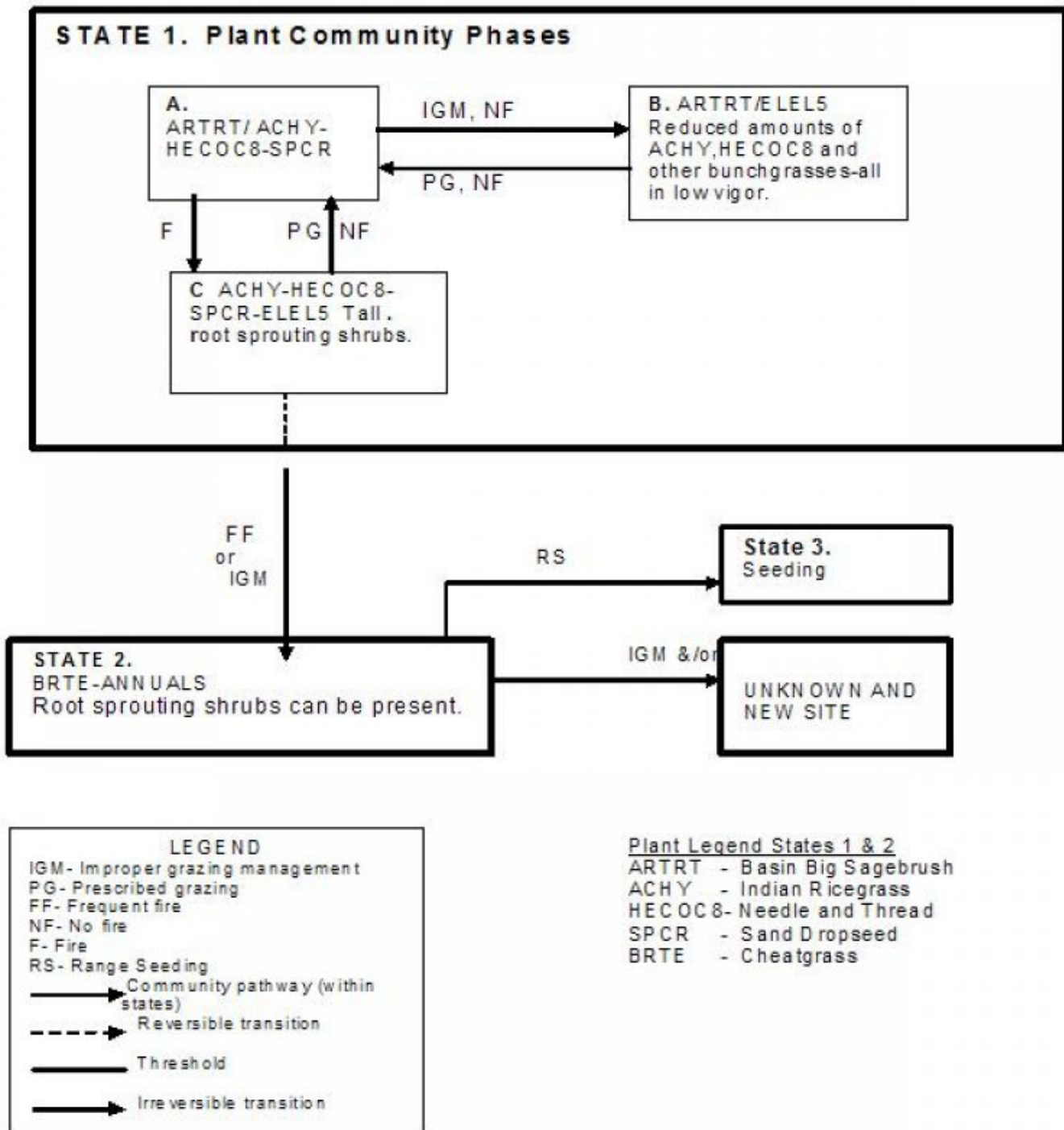
Practice Limitations.

Extreme care must be exercised for seedbed preparation and seeding due to the severe wind erosion hazard. There is a moderate to severe chance for seeding failure during unfavorable moisture years on this site. There are no physical limitations for brush management on this site except that removal of basin big sagebrush may trigger a cheatgrass invasion and wind erosion.

Livestock water may be lacking on or near this site. Light textured soils make certain precautions necessary in planning water developments, salting, or fencing.

## **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".



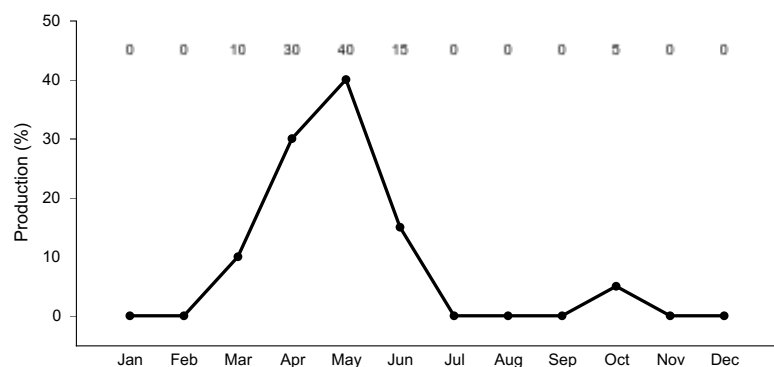
## State 1 Historic Climax Plant Community (HCPC)

### Community 1.1 Historic Climax Plant Community (HCPC)

The HCPC has basin big sagebrush in the overstory with Indian ricegrass and needle and thread dominating the understory. Sand dropseed, arrowleaf balsamroot, sand scurfpea, and antelope bitterbrush are common. A wide variety of grasses, forbs, and shrubs occur 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	308	465	616
Shrub/Vine	196	291	392
Forb	56	84	112
<b>Total</b>	<b>560</b>	<b>840</b>	<b>1120</b>



**Figure 4. Plant community growth curve (percent production by month). ID0501, KRLA2/ACHY. HCPC.**

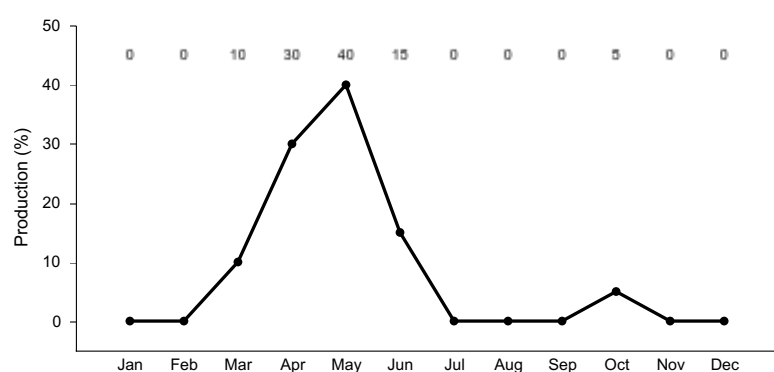
## State 2

### State 1, Plant community B

#### Community 2.1

### State 1, Plant community B

This plant community is dominated by basin big sagebrush with reduced amounts of Indian ricegrass, needle and thread, and other deep-rooted perennial bunchgrasses. Bottlebrush squirreltail has increased in the understory. All deep-rooted perennial bunchgrasses are typically in low vigor. Basin big sagebrush has 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 5. Plant community growth curve (percent production by month). ID0501, KRLA2/ACHY. HCPC.**

## State 3

### State 1, Plant community C

#### Community 3.1

### State 1, Plant community C

This plant community is dominated by Indian ricegrass, needle and thread, sand dropseed, and tall root-sprouting shrubs. Bottlebrush squirreltail has increased. Forbs remain about in the same proportion as Plant Community A. Basin big sagebrush and antelope bitterbrush have been reduced significantly due to wildfire. Three-tip sagebrush



may have re-sprouted. Some cheatgrass may have invaded the site. This plant community is the result of wildfire.

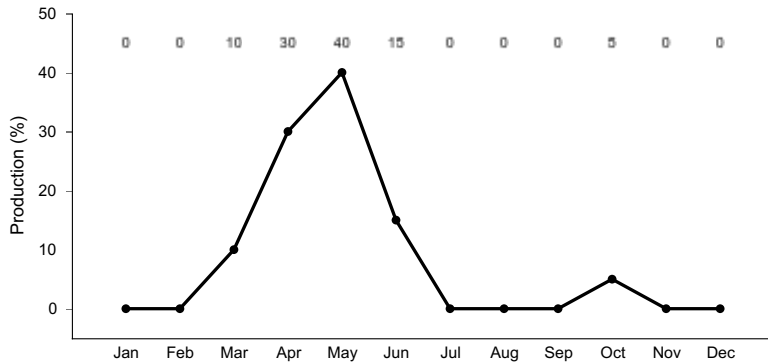


Figure 6. Plant community growth curve (percent production by month). ID0501, KRLA2/ ACHY. HCPC.

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

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

This plant community is dominated by cheatgrass and other annuals. Root sprouting shrubs such as rabbitbrush and horsebrush can be present, dependent upon, how frequent, fire has occurred. Some soil loss from wind erosion has occurred. This state has developed due to frequent fires or improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

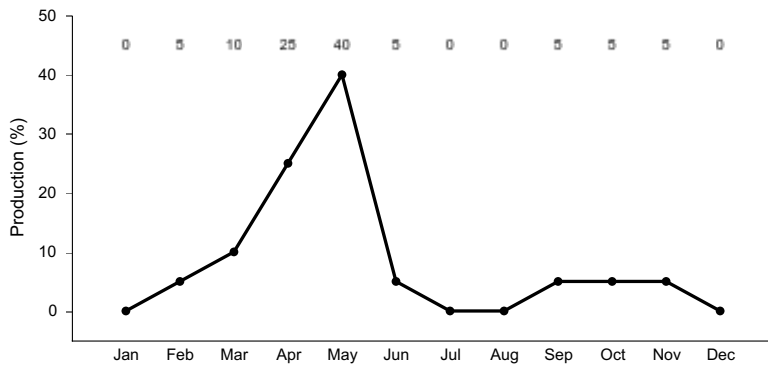


Figure 7. Plant community growth curve (percent production by month). ID0502, POSE/ BRTE- ANNUALS. State 2.

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

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

This plant community results from range seeding. The seeding may be introduced species or it may be made up of native species that attempt to mimic the historic plant community.

**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 from wind erosion 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 not economically practical 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. 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. With reduced shrub cover shrub obligate avian and mammal species become rare including sage-grouse, brewer's sparrow, sage sparrow, sage thrasher, and pygmy rabbit. Encroachment of noxious and invasive plant species (cheatgrass) 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 may unique cave habitats for several sensitive animal species, including the Blind Cave Leiodid Beetle, Cave Obligate Mite, Bats and Cave Obligate Harvestman.

State 1 Phase 1.1 - Basin Big Sagebrush/ Indian Ricegrass/ Needle and Thread/ Sand Dropseed Reference Plant Community (RPC): The RPC provides a diversity of grasses, forbs and shrubs, used by native insect communities who assist in the pollination process for the plant community. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western rattlesnake, western toad 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. Brood-rearing habitat for the sage grouse may be provided by this diverse plant community. Open areas may be utilized by burrowing owls. Indian ricegrass provides excellent early spring feed for ungulates (mule deer, antelope, and elk) and basin big sagebrush is also utilized as browse. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pygmy rabbits would utilize the site.

State 1 Phase 1.2- Basin Big Sagebrush/ Bottlebrush Squirreltail/ Indian Ricegrass/ Needle and Thread Plant Community: This plant community is the result of improper grazing management and a lack of fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory and can lead to an increase in threetip sagebrush. The reduced herbaceous understory results in lower diversity and numbers of insects. You can expect a decrease in populations and diversity of reptiles due to the reduced diversity and canopy cover of herbaceous vegetation. The reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Shrub-steppe obligate avian species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Brood-rearing habitat for sage-grouse is limited due to the reduced diversity and canopy cover of herbaceous vegetation. Winter cover is provided for mule deer and antelope. With an increase in threetip sagebrush the wildlife use would decrease due to the poor palatability and nutritional value of threetip. A 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 - Indian Ricegrass/ Needle and Thread/ Sand Dropseed/ 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, limiting use by shrub obligate animals. Insect diversity would be reduced 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

severely reduce or eliminate use of these areas for nesting by Brewer's sparrow, sage sparrow and sage thrasher. This plant community provides limited brood-rearing habitat for sage-grouse when site is adjacent to sagebrush cover. The site would not be suitable as winter habitat for sage-grouse. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Indian ricegrass provides excellent early spring feed for ungulates (mule deer, antelope, and elk) but the lack of sagebrush cover would reduce fall and winter use by mule deer and elk. An increase in antelope use can occur. Small mammal diversity would favor grass seed eating species and the plant community would not provide suitable habitat for pygmy rabbits.

**State 2 - Cheatgrass and Annual Plant Community:** This state has developed due to frequent fires or improper grazing management. The reduced forbs component in the plant community would support a very limited population of pollinators. Most reptilian species would not be supported with food, water or cover. The plant community would not support sage-grouse, sage thrasher, Brewer's sparrow or sage sparrow. 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) would be more palatable. At other times of the year large mammals would not regularly utilize these areas due to poor food and cover conditions. Grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse and kangaroo rat would utilize this site for nesting and/or foraging.

**State 3 - Range Seeding Plant Community:** The proposed seeding mixture (native or non-native) would determine the animal species that would utilize the area. A diverse seed mixture of grasses and forbs would provide similar habitat conditions as in the herbaceous plant community described in State 1 phase 1.3. A diverse seed mixture of grasses, forbs and shrubs would provide similar habitat conditions as described in State 1 phase 1.1 or 1.2. A monoculture of non-native grass species would not support diverse populations of insects, reptiles, avians, or mammals. Sagebrush obligate animal species would not be supported with a monoculture of grass species. Grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat, and antelope would utilize this site for nesting and/or foraging. Birds of prey including hawks and falcons may range throughout these areas looking for prey species.

#### Grazing Interpretations.

This site is best suited for livestock grazing in the spring, summer, and fall. There are few limitations to grazing. The distance to water may be a problem in some areas.

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 recreation use except hunting.

### **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

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

## Contributors

DLF

## Approval

Kirt Walstad, 4/29/2024

## 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, Suite C Boise, ID 83709
Date	03/28/2007
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills: rills rarely occur on this site. If rills are present they are most likely to occur on steeper slopes greater than 10% and immediately following wildfire or a high intensity convection storm.

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

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3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes: pedestals are rare on this site. In areas where slopes are greater than 10% and where flow patterns and /or rills are present, a few pedestals may be expected. Terracettes are rare but may develop from livestock trailing on slopes greater than 10 percent.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground: data not available. On sites in mid-seral status, bare ground may range from 50-60 percent.

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

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind-Scoured, Blowouts, and/or Deposition Areas: usually does not occur. Some wind erosion may occur immediately following a wildfire or if the cover is removed mechanically. Active dunes may occur as inclusions within the site but are never a part of the site.

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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 or further on slopes greater than 10 percent following a significant run-off event. Coarse litter generally does not move.

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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 to 6 but needs to be tested.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil Surface Loss or Degradation: the thickness of the A or A1 horizon ranges from 1 to 9 inches. Structure ranges from single grain, weak very fine or fine granular to weak thin, medium or thick platy. Soil organic matter (SOM) ranges from 0 to 2 percent.

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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. Shrubs accumulate snow in the interspaces. Terracettes, although rare, provide a favorable micro-site for vegetation establishment which further increases infiltration.

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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.

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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 >>tall shrubs> perennial forbs> shallow rooted grasses.

Sub-dominant:

Other:

Additional:

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

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14. **Average percent litter cover (%) and depth ( in):** Litter Amount: annual litter cover in the interspaces will be 20-30 percent to a depth of

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual Production: is 750 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 50-60 percent of the total, forbs 5-15 percent, and shrubs 30-40 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:** Invasive Plants: cheatgrass, bulbous bluegrass, rush skeletonweed, Russian thistle, scotch thistle, spotted, and diffuse knapweed.

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

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