

## **Ecological site R011XY015ID Loamy Bottom 8-14 PZ ARTRT/LECI4**

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

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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

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 Precipitation or Climate Zone: 8-14” P.Z.

### **Classification relationships**

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 receive additional moisture  
 Soils are:  
 Not saline or saline sodic  
 Somewhat excessively drained  
 If water table is present, it is below 40” of the soil surface  
 Very deep, with <35% coarse fragments (by volume). Not 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**

R010XA004ID	<b>Loamy 12-16 PZ ARTRV/FEID-PSSPS</b>
R011XY020ID	<b>Dry Meadow POSE-PHAL2</b>

### **Similar sites**

R011XY020ID	<b>Dry Meadow POSE-PHAL2</b>
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. tridentata</i>

Herbaceous	(1) <i>Leymus cinereus</i>
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### Physiographic features

This site occurs on nearly level to rolling slopes that range from 0 to 5 percent. This site occurs on all aspects and elevations extend from 2500 to 6500 feet (762-1981 m.) Collister, Porter and Staircase have a high water table. This site is associated with floodplains, drainageways and valleys.

**Table 2. Representative physiographic features**

Landforms	(1) Flood plain (2) Drainageway (3) Valley
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	2,500–6,500 ft
Slope	0–5%
Water table depth	40–60 in
Aspect	Aspect is not a significant factor

### Climatic features

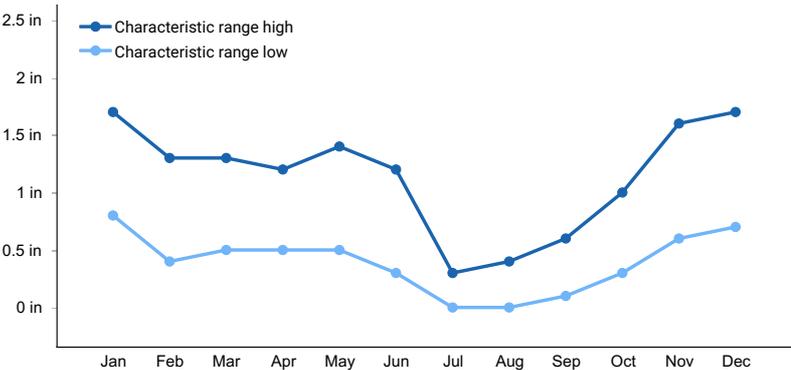
MLRA 11 is part of Idaho’s Snake River Plain. The elevation ranges from 2,077 to 7,549 feet, with a mean of 3,992 feet. Most of the precipitation falls as rain in the fall, winter and spring. Very little precipitation occurs during the summer months. In general this MLRA receives more sun than the U.S. 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)	12 in



**Figure 1. Monthly precipitation range**

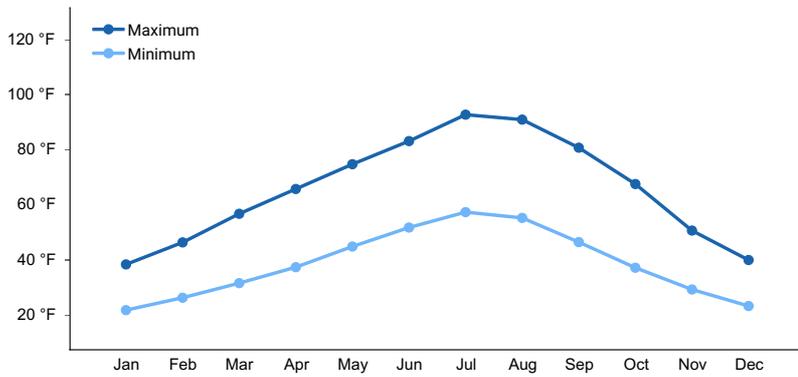


Figure 2. Monthly average minimum and maximum temperature

## Influencing water features

This site may be influenced by run-in from adjacent sites.

## Soil features

Most of the soils supporting this site are generally very deep. Beartrap soils are moderately deep over bedrock. The soils are well to somewhat excessively drained, moderately slow to moderately rapid permeability above bedrock or a duripan. Runoff is very low to very high. The erosion hazard is slight to very severe by water, and moderate by wind. The available water holding capacity (AWC) is low to moderate. The surface texture is generally loamy with few or no surface stones. These soils are characterized by a xeric moisture regime or an aridic moisture regime that borders on xeric. The soil temperature regime is mesic or frigid.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Sandy loam
Drainage class	Moderately well drained to somewhat excessively drained
Permeability class	Moderately slow to moderately rapid
Soil depth	20–60 in
Surface fragment cover ≤3"	0–17%
Surface fragment cover >3"	0–26%
Available water capacity (0-40in)	3.2–6.6 in
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)	0–85%

## Ecological dynamics

Ecological Dynamics of the Site:

The dominant visual aspect of this site is grasses although shrubs are prevalent. Composition by weight is approximately 60 percent grasses, 10 percent forbs and 30 percent shrubs.

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 basin wildrye, thickspike wheatgrass and basin big sagebrush. Nevada bluegrass is subdominant. The plant species composition of Phase A is listed later under "HCPC Plant Species Composition".

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 and lagomorphs.

Fire has historically occurred on the site at intervals of 15-25 years.

Total annual production is 1200 pounds per acre (1344 kilograms per hectare) in a normal year. Production in an unfavorable year is 800 pounds per acre (896 kilograms per hectare). Production in a favorable year is 1600 pounds per acre (1792 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 suitable for livestock grazing in the late spring, summer, and fall. Water is often limited in the summer and fall unless it is adjacent to an intermittent or perennial stream. This site provides good cover for most wildlife species in all seasons.

This site has limited opportunities for recreation.

The site has moderately low runoff potential. Snow accumulates on the site due to the presence of tall shrubs at the higher elevations.

Due to the deep soils and inherent productivity of the grass component and relatively flat slopes it is fairly resistant to disturbances that can potentially degrade the site. Site degradation is usually the result of downstream changes of grade and/ or loss of the understory component which leads to the development of gullies. Once gullies begin to develop, erosion is accelerated by the concentrated water flows within the gully itself.

Impacts on the Plant Community.

Influence of fire:

This site has a normal fire frequency of 15-25 years. Immediately after a fire, basin wildrye is stimulated. Gray and green rabbitbrush typically re-sprout and basin big sagebrush is eliminated. In the absence of normal fire frequency, bitterbrush, when present, and basin big sagebrush may increase. Grasses and forbs decrease as shrubs increase.

When fires become more frequent than historic levels (15-25 years), basin big sagebrush is reduced significantly. With continued short fire frequency, big sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass and Nevada bluegrass. Rabbitbrush can become the dominant overstory species. The understory species may be replaced by cheatgrass at lower elevations. Sandberg bluegrass and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive species generally increase.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. The vigor of the perennial grasses can be reduced significantly by heavy early season grazing, especially basin wild rye. This type of management leads to reduced vigor of the other bunchgrasses also. With reduced vigor, recruitment of these species declines.

Continued improper grazing management influences fire frequency by increasing fine fuels. If cheatgrass and other annuals increase due to improper grazing management, 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. However, 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 lead to an increase in cheatgrass and other annuals which will potentially lead to more frequent fire intervals.

#### Weather influences:

Because of the deep soils and influence of run-on, the production of this site changes little during dry years. 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.

#### Influence of Insects and disease:

Periodic disease and insect outbreaks can affect vegetation health. Outbreaks of Black grass bugs occur commonly on basin wildrye and the wheatgrasses. They seldom kill the plants but do reduce vigor and affect the palatability for grazing animals. An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available.

#### Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Many of the 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.

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

#### Watershed.

The largest threat to degradation of this site is that of rill and gully development. Soils are usually very deep and have few coarse fragments in the profile to prevent erosion. If the perennial grass cover is depleted, rill and gully development can occur rapidly. High run-off events from the adjacent uplands can severely damage or change the normal stream channel on the site. Once gully development begins, the water table is lowered and run-on water no longer flows across the site. As the available soil moisture is lowered, productive potential is lost. Eventually the watertable is below the rooting depth of the perennial grasses. These grasses are ultimately replaced by shrubs, annual grasses, and forbs. Extreme gully development can move the site across the threshold to a new, less productive site.

#### Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

##### State 1.

Phase A to B. Develops with either prescribed or wild fire.

Phase A to C. Usually results from improper grazing management and no fire.

Phase B to A. Develops in the absence of fire.

Phase B to C. Develops with improper grazing management and no fire.

Phase C to B. Develops from prescribed grazing and fire.

Phase C to A. Develops from prescribed grazing.

State 1 Phase C to State 2. Develops through improper grazing management and fire. The site has crossed the threshold. It is generally not economically feasible to move this state back towards the HCPC.

State 2 to State 3. Pest management, brush management and range seeding are used to change this plant community.

State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by channel downcutting, improper grazing management and/or fire cause this state to retrogress to a new site with reduced potential. It is generally not economically feasible to move this state back towards the HCPC.

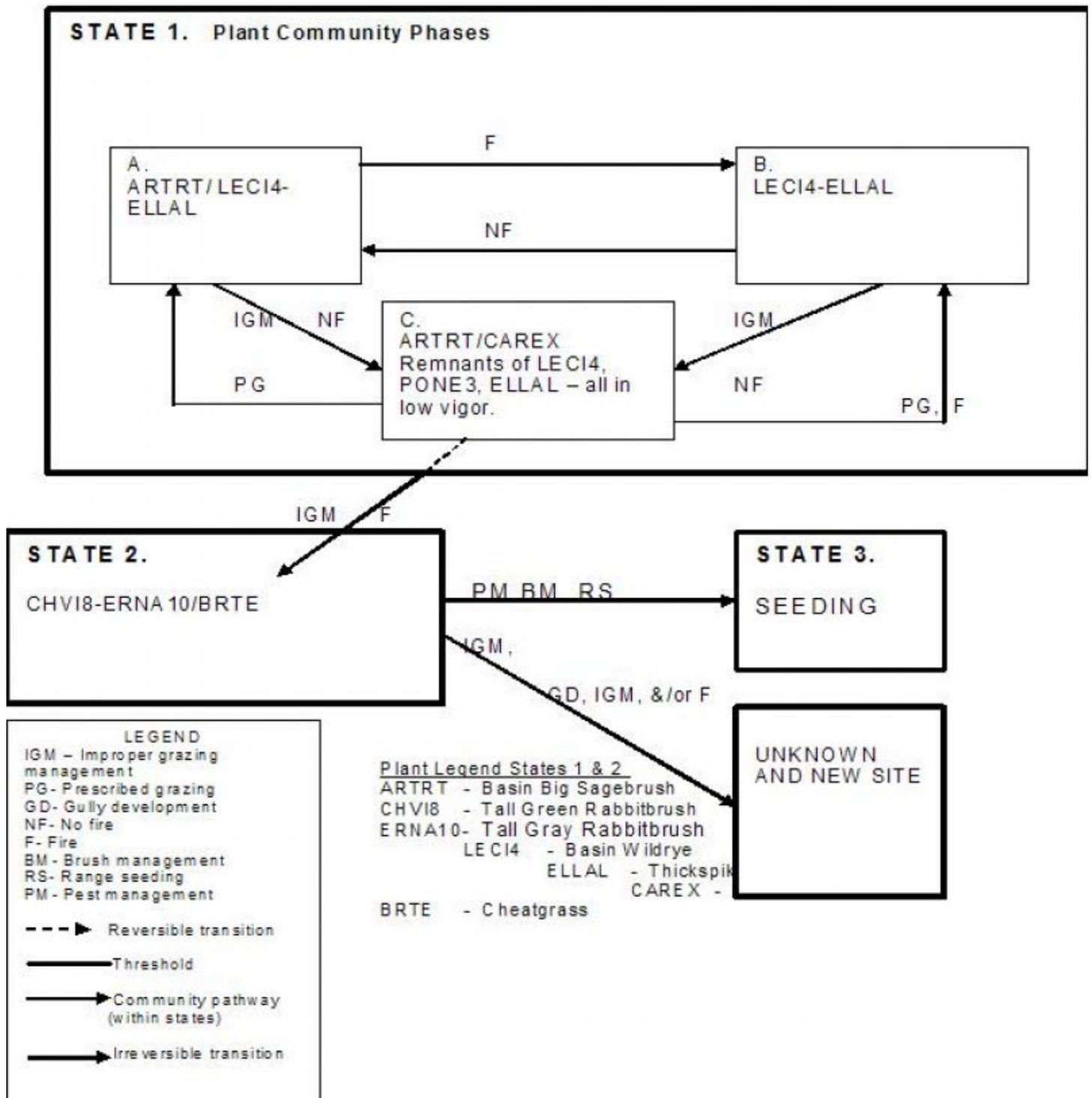
Practice Limitations.

There are few restrictions to seeding on this site. Spring wetness may prevent early planting.

Brush management is feasible. The wildlife impacts, however, should be carefully evaluated before application of either seeding or brush management practices.

### **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)

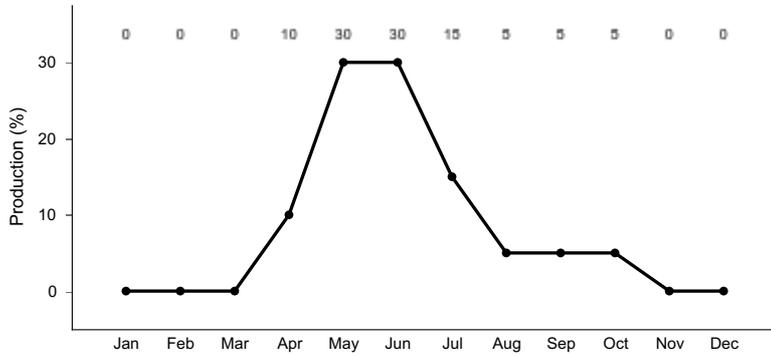
#### Community 1.1

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

The HCPC is dominated by basin wildrye and thickspike wheatgrass. Basin big sagebrush is prevalent. Understory species may include Nevada bluegrass, bluebunch wheatgrass, bottlebrush squirreltail, and dryland sedge. Natural fire frequency is 15 to 25 years.

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

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	480	720	960
Shrub/Vine	240	360	480
Forb	80	120	160
<b>Total</b>	<b>800</b>	<b>1200</b>	<b>1600</b>



**Figure 4. Plant community growth curve (percent production by month). ID0613, ARTRT/ LECI4. State 1.**

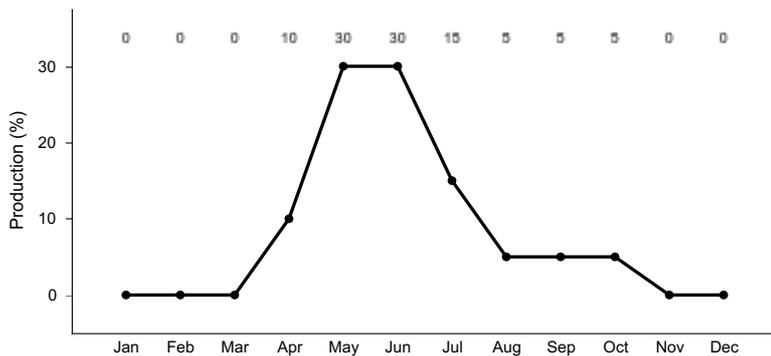
**State 2**

**State 1, Plant community B**

**Community 2.1**

**State 1, Plant community B**

This plant community is dominated by basin wildrye and thickspike wheatgrass. Few shrubs are present, since fire has removed them. Rabbitbrush generally increases after fire. Understory species include Nevada bluegrass, dryland sedge, bottlebrush squirreltail, bluebunch wheatgrass, tapertip hawksbeard, arrowleaf balsamroot, and lupine. This state has developed due to fire.



**Figure 5. Plant community growth curve (percent production by month). ID0613, ARTRT/ LECI4. State 1.**

**State 3**

**State 1, Plant community C**

**Community 3.1**

**State 1, Plant community C**

This plant community is dominated by basin big sagebrush and dryland sedge. Remnants of basin wildrye, Nevada bluegrass, and thickspike wheatgrass are present but in extremely low vigor. The perennial grasses that remain are typically protected in and around the sagebrush plants. This state has developed due to improper grazing

management and lack of fire.

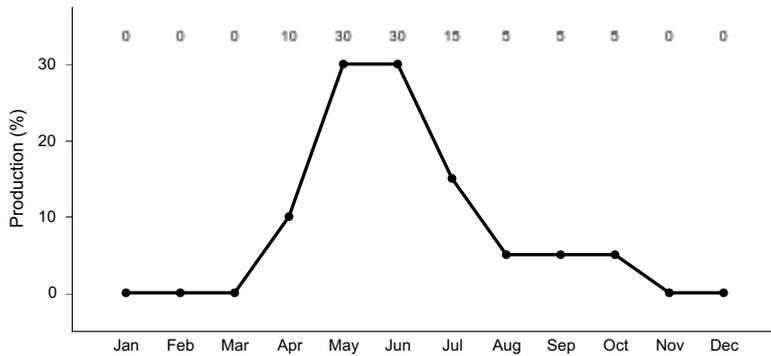


Figure 6. Plant community growth curve (percent production by month). ID0613, ARTRT/ LECI4. State 1.

## State 4 State 2

### Community 4.1 State 2

This plant community is dominated by root-sprouting shrubs (rabbitbrushes), annual grasses and forbs. This state has developed due to improper grazing management and fire. Some soil loss has occurred. Gully development may be present. The site has crossed the threshold. It is generally not economically feasible to move this state back towards the HCPC.

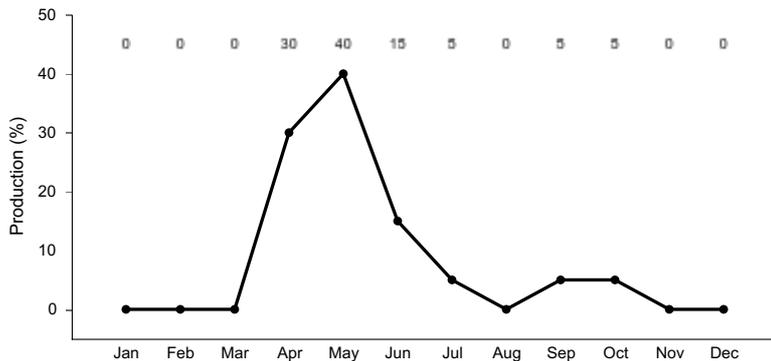


Figure 7. Plant community growth curve (percent production by month). ID0609, ARTRT/ ARTRW8 POSE/ ANNUALS. State 2.

## State 5 State 3

### Community 5.1 State 3

This plant community is made up of either introduced or 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 has occurred. Infiltration has been reduced and run-off has become more rapid. Gully development has

lowered the watertable so that it is below the rooting depth of the perennial grasses and forbs. This state has developed due to continued improper grazing management and/or fires. It is generally not economically feasible to move this state back towards the HCPC.

## **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 to a lesser degree pronghorn antelope. Important seasonal habitat is provided by the tall, dense vegetation 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, long-nosed snake, groundsnake, Great Basin collared lizard, 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 and bulbous bluegrass) can replace native plant species which provide critical feed, brood-rearing and nesting cover for a variety of native wildlife. Water is provided by seasonal runoff, artificial water catchments, adjacent streams, and spring sites. This rangeland 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 - Basin Big Sagebrush/ Basin Wildrye/ Thickspike Wheatgrass 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, streams, and isolated water bodies adjacent to this plant community. Spring developments that capture all available water would preclude the use of this site by amphibians. The plant community supports a variety of migratory and resident avian species that utilize the grasses, forbs, shrubs, and water for food, brood-rearing, and nesting cover. When streams are adjacent to this site, significant use of the tall and dense vegetation by waterfowl and shorebirds may occur. Shrub-steppe obligate avian species of concern include the Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Habitat (i.e. lek sites, brood-rearing, winter cover and food) for sage-grouse is provided by this diverse plant community. Significant brood-rearing habitat for sage-grouse is provided in this site. The plant community supports seasonal (late spring, summer, and winter) habitat needs for mule deer providing food, thermal, and young of year cover. Antelope may utilize the site for thermal cover and young of year cover. 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 Wildrye/ Thickspike Wheatgrass Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no basin big sagebrush provides less vertical structure, limiting use by sagebrush obligate animals. An increase in tall green rabbitbrush would provide some replacement of vertical structure and late summer and fall pollinator habitat. Insect diversity may be reduced but a native forb plant community similar to State 1 Phase 1.1 would still support select pollinators. Reptile use, including short horned lizard, sagebrush lizard, and western rattlesnakes would be limited 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 dominance of herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Mule deer and antelope habitat including forage, thermal, and young of year cover would still be provided. Small mammal diversity would be reduced and the loss of sagebrush would not provide suitable habitat for pygmy rabbits.

State 1 Phase 1.3 - Basin Big Sagebrush/ Dryland Sedge Plant Community: This plant community is the result of

improper grazing management and lack of fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. The reduced herbaceous understory results in reduced diversity of insects. You can expect a decrease in populations and diversity of reptiles due to the reduced diversity and canopy cover of herbaceous vegetation. Shrub-steppe obligate avian species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Critical habitat (lek sites, brood-rearing, winter cover and food) for sage-grouse is limited due to the reduced diversity and canopy cover of herbaceous vegetation. The loss of basin wildrye reduces available thermal cover and young of year cover for mule deer and antelope. The loss of the understory will result in a shorter forage season for large mammals. A small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pygmy rabbits would utilize this plant community.

**State 2 – Tall Green Rabbitbrush/ Tall Gray Rabbitbrush/ Cheatgrass Plant Community:** This state has developed due to fire and improper grazing management. This plant community would not support as diverse an insect community as in State 1 Phase 1.1. The rabbitbrushes would provide late summer and fall pollinator habitat. The reduced forb component in the plant community would support a very limited population of pollinators. Food and cover for reptile species would be reduced due to the loss of understory vegetation. The plant community would not support the habitat requirements for 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. Mule deer may utilize the invasive herbaceous vegetation in the early part of the year, and rabbitbrush in the winter when the plants would be more palatable. The rabbitbrush may provide thermal cover and young of year cover for mule deer and antelope. Pygmy rabbits would not utilize this site due to the loss of sagebrush.

**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 1.2. A diverse seed mixture of grasses, forbs, and shrubs would provide similar habitat conditions as described in State 1 phase 1.1 or 1.3. A monoculture of non-native grass species would not support diverse populations of insects, reptiles, birds, 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, mule deer, and antelope would utilize this site for nesting and/or seasonal foraging. Birds of prey including hawks and falcons may range throughout these areas looking for prey species.

#### Grazing Interpretations:

This site is best adapted for livestock grazing in the summer and fall grazing season. There are few limitations to grazing on this site.

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 provides limited opportunities for recreational activities.

### **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

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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

## Type locality

Location 1: Clark County, ID	
General legal description	Headquarters area, U.S. Sheep Experiment Station, Dubois, ID

## Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush- Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35

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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.

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Date	03/28/2007
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills: are not common on this site. If the site is degrading due to gully down-cutting, rills may occur on the side slopes of the gully.  

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2. **Presence of water flow patterns:** Water-Flow Patterns: are common on this site. When they occur they are long, often running the length of the site and disrupted by cool season grasses and tall shrubs. Water flow patterns are also common from run-in from the adjacent uplands.  

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3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes: are rare on this site.  

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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: ranges from 20-30 percent.  

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5. **Number of gullies and erosion associated with gullies:**  

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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.  

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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 6 feet or more 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. The A or A1 horizon is typically 2 to 10 inches thick.  

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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: structure ranges from weak very fine, fine and medium granular to moderate thin and medium platy. Soil organic matter (SOM) is 0.8 to 5 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 Disposition Relative to Infiltration: bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration. Tall grasses and shrubs accumulate snow in the interspaces at higher elevations.

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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 bunchgrasses.

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 wildrye and basin big sagebrush 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: additional litter cover data is needed but is expected to be 20-25 percent to a depth of 0.2 inches. Under mature shrubs and basin wildrye litter is 0.5 inches deep and is 90-100 percent ground cover.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual Production: is 1200 pounds per acre (1344 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 55-65 percent of the total production, forbs 5-15 percent and shrubs 25-35 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: include cheatgrass, bulbous bluegrass, leafy spurge, whitetop, annual kochia, annual mustards, Russian thistle, rush skeletonweed, Canada, musk, and scotch thistle, and diffuse and spotted 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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