

## Ecological site R011XY009ID Silty 7-10 PZ KRLA2/ACHY

Last updated: 4/06/2020  
Accessed: 05/04/2024

### 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

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Precipitation or Climate Zone: 7-10" 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 not receive additional moisture

Soils are:

Not saline or saline sodic

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

Textures are generally silt loams 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

R011XB005ID	Fractured Loamy 8-16 PZ ARTRW8/PSSPS
R011XB019ID	Loamy 7-10 PZ ARTRW8/HECOC8-ACHY
R011XY010ID	Calcareous Loam 7-10 PZ ATCO-PIDE4/ACHY-ACTH7

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

### Physiographic features

This site occurs on slopes from 0 to 20 percent. Elevations range from 2300-5000 feet (700-1550 meters).

**Table 2. Representative physiographic features**

Landforms	(1) Plain
Flooding frequency	None
Elevation	701–1,524 m
Slope	0–20%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

### Climatic features

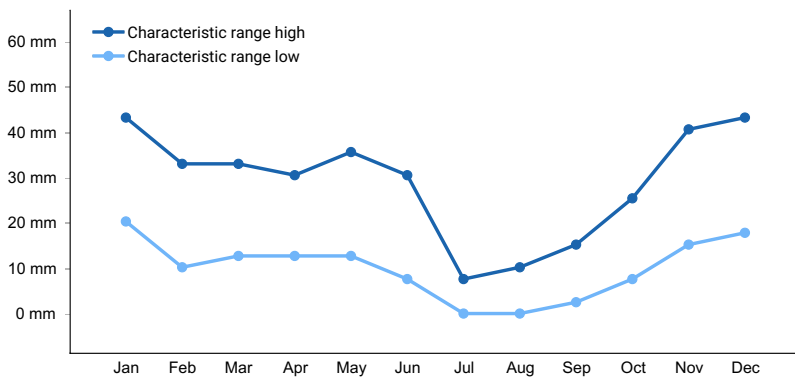
MLRA 11 is part of Idaho’s Snake River Plain. The elevation ranges from 2,077 to 7,549 feet, with a mean of 3,992 feet. Most of the precipitation falls as rain in the fall, winter and spring. Very little precipitation occurs during the summer months. In general this MLRA receives more sun than the U.S.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

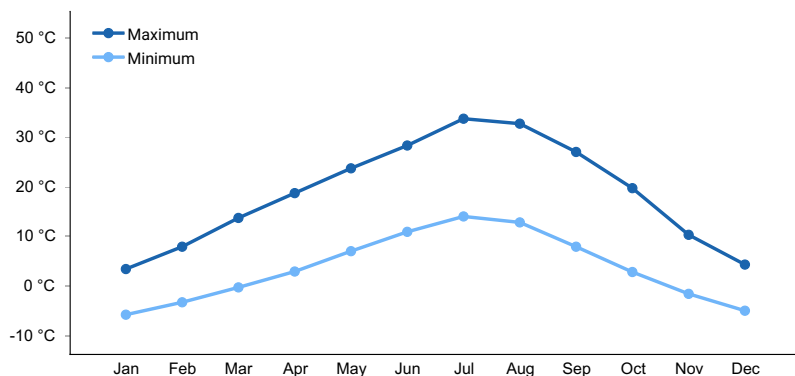
The average annual temperature ranges from 38° to 65° Fahrenheit. With a maximum average temperature of 65 degrees F. and a minimum average of 38 degrees F. The frost free interval ranges from 139 to 165 days and the freeze free interval ranges from 168 to 196 days.

**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 very deep over gravels or bedrock. The soils are well drained, with moderate permeability. Runoff is low to moderate. The erosion hazard is slight by water, and moderate by wind. The available water holding capacity (AWC) is moderate. The surface texture is silt loam and may be high in volcanic glass. 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

Garbutt  
Wholan

**Table 4. Representative soil features**

Surface texture	(1) Sandy loam
Drainage class	Well drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0–3%
Surface fragment cover >3"	0–3%
Available water capacity (0-101.6cm)	15.49–21.08 cm
Calcium carbonate equivalent (0-101.6cm)	1–5%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	7.4–9.6
Subsurface fragment volume <=3" (Depth not specified)	0–3%
Subsurface fragment volume >3" (Depth not specified)	0–3%

## Ecological dynamics

The dominant visual aspect of this site is winterfat, Indian ricegrass, and bottlebrush squirreltail. Composition by weight is approximately 20-30 percent grasses, 5-10 percent forbs, and 60-70 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 pronghorn antelope, mule deer, and lagomorphs.

Fire has historically occurred on the site at intervals of 80-100 years. Fire only occurs in favorable 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 winterfat and Indian ricegrass . Subdominants include bottlebrush squirreltail and Hoods phlox with an occasional Gardner saltbush. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 500 pounds per acre (555 kilograms per hectare) in a normal year. Production in a favorable year is 700 pounds per acre (777 kilograms per hectare). Production in an unfavorable year is 250 pounds per acre (278 kilograms per hectare). Structurally, medium shrubs are dominant, followed by cool season deep-rooted perennial bunchgrasses, followed by perennial forbs.

#### FUNCTION:

This site is suited for grazing by domestic livestock in late spring, fall, and winter. This site provides good to excellent habitat for pronghorn antelope and other upland wildlife, especially in winter. The site offers little value for recreation or aesthetics.

Due to the low rainfall, this site is easily degraded by improper grazing management or frequent fires.

Impacts on the Plant Community.

#### Influence of fire:

In a salt desert shrub community like this, fire is a relatively rare occurrence. In the absence of normal fire frequency, shrubs can gradually increase. Grasses and forbs decrease as shrubs increase.

When fires become more frequent than historic levels (80-100 years), winterfat and bud sagebrush are reduced significantly. With continued short fire frequency, winterfat and bud sagebrush can be completely eliminated along with many of the desirable understory species such as bottlebrush squirreltail and Indian ricegrass. Winterfat will re-sprout after a low intensity fire. High intensity fires will kill the plant. Shrubs such as spiny hopsage, Gardner saltbush, rabbitbrush, and broom snakeweed, if present, will re-sprout after fire. These species may be replaced by cheatgrass along with a variety of annual and perennial forbs including invasive plants. Sandberg bluegrass usually is maintained in the community.

#### Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. The season of use, primarily in the spring and early summer, is more detrimental than intensity of use. This type of management leads to reduced vigor of the bunchgrasses and palatable shrubs such as bud sagebrush and winterfat. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in Gardner saltbush and noxious and invasive plants.

Continued improper grazing management influences fire frequency with an increase in cheatgrass that accelerates fire frequency.

Proper grazing management that addresses frequency, duration, and intensity of grazing can maintain the integrity of the plant community.

#### Weather influences:

Above normal precipitation in late 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. An outbreak of a particular insect is usually influenced by weather. Mormon cricket and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Many of the annual 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, primarily pronghorn antelope, use this site in the spring, fall, and winter. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff on slopes greater than 10 percent occur when bud sagebrush and winterfat are removed with frequent fires, particularly the year following the fire event. The increased runoff also causes sheet and rill erosion. 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 with or without improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

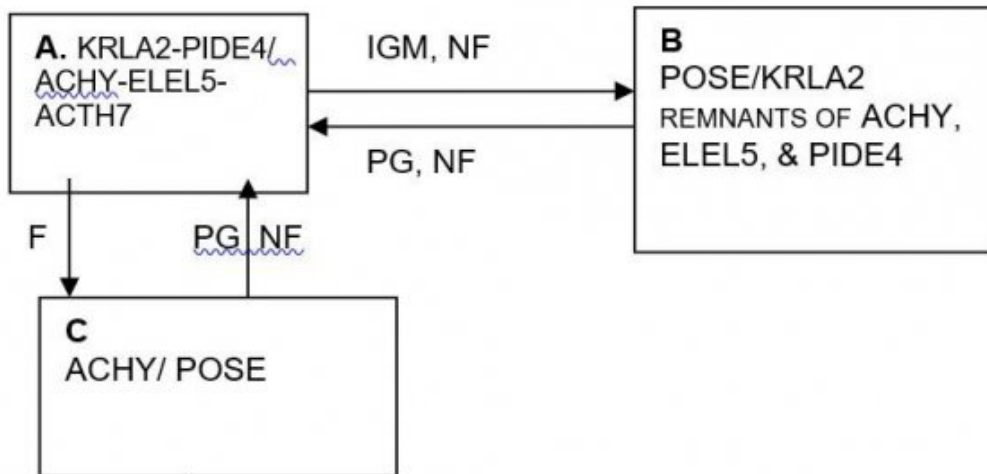
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fire cause this state to cross the threshold and retrogress to a new site with reduced potential. It is economically impractical to return this plant community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

Practice Limitations.

Seeding limitations are severe due to low annual precipitation. Brush management is usually not recommended due to moderate to high forage value of shrubs that occur on the site.

**State and transition model**

## STATE 1. Plant Community Phases



FF  
w/or w/out  
IGM

**STATE 2.**  
POSE-BRTE/ANNUALS  
Root sprouting shrubs e.g. GUSA2 &  
CHRYS9

IGM &/or FF

UNKNOWN  
AND NEW SITE

### LEGEND

IGM- Improper grazing management  
PG- Prescribed grazing  
FF- Frequent fire  
NF- No fire  
F- Fire

→ Community pathway (within states)  
-----> Reversible transition  
————— Threshold  
—————> Irreversible transition

### PLANT LEGEND STATES 1 & 2

KRLA2 - Winterfat  
PIDE4 - Bud Sagebrush  
ACHY - Indian Ricegrass  
ELEL5 - Bottlebrush Squirreltail  
ACTH7 - Thurber's Needlegrass  
POSE - Sandberg Bluegrass  
BRTE - Cheatgrass  
GUSA2 - Broom Snakeweed  
CHRYS9- Rabbitbrush

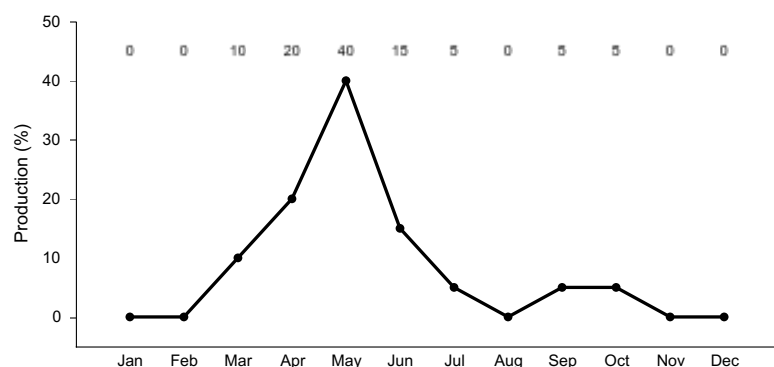
State 1  
State 1 Phase A

Community 1.1  
State 1 Phase A

Reference Plant Community Phase. This plant community has winterfat and bud sagebrush in the overstory with Indian ricegrass dominating the understory. Gardner saltbush, and spiny hopsage are often present in the community in smaller amounts. Other significant species in the plant community are bottlebrush squirreltail, Thurber's needlegrass, Sandberg bluegrass, and Hoods phlox. Natural fire frequency is 80-100 years.

**Table 5. Ground cover**

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%



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

## State 2

### State 1 Phase B

#### Community 2.1

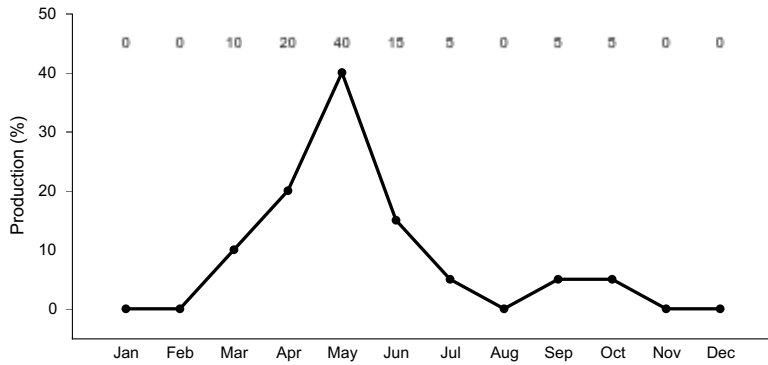
### State 1 Phase B

This plant community is dominated by Sandberg bluegrass with small amounts of winterfat remaining. This state has developed due to improper grazing management and lack of fire. There are remnants of Indian ricegrass, bottlebrush squirreltail, and bud sagebrush. These deep-rooted perennial bunchgrasses and shrubs are typically in low vigor.

**Table 6. Ground cover**

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%

Biological crusts	0%
Litter	20-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%



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

**State 3  
State 1 Phase C**

**Community 3.1  
State 1 Phase C**

This plant community is dominated by Indian ricegrass, Sandberg bluegrass, and bottlebrush squirreltail. Forbs remain about in the same proportion as Phase A. Gardner saltbush, rabbitbrush, and broom snakeweed, when present, have re-sprouted. This state is a result of wildfire.

**Table 7. Ground cover**

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%



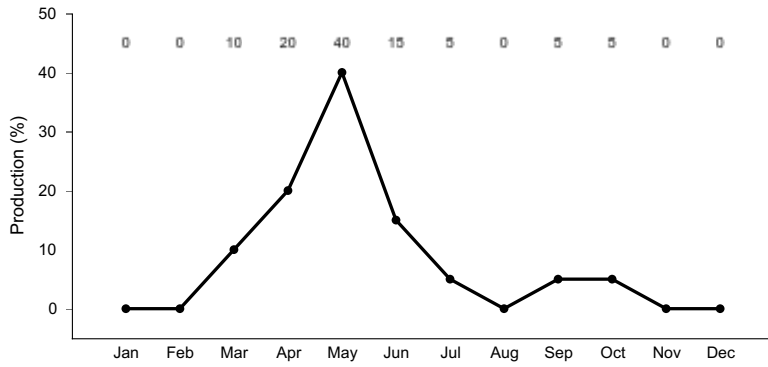


Figure 5. Plant community growth curve (percent production by month). ID0401, KRLA2/ACHY. Reference State.

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

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

This plant community is dominated by Sandberg bluegrass, cheatgrass, and other annuals. Root sprouting shrubs such as broom snakeweed and rabbitbrush can be present, dependent upon, how frequent fire has occurred. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices. This state has developed due to frequent fires with or without improper grazing management.

Table 8. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

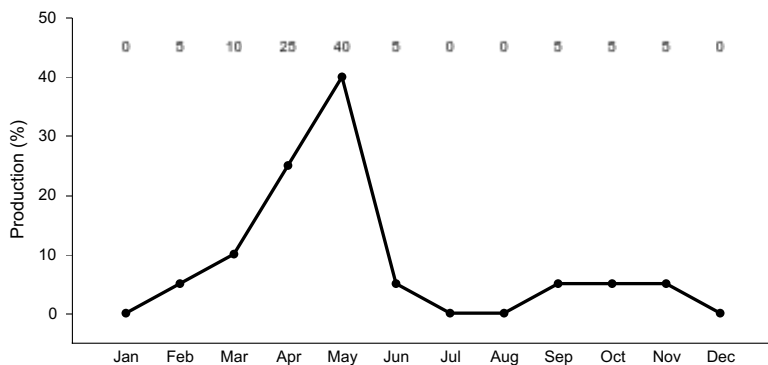


Figure 6. Plant community growth curve (percent production by month). ID0402, POSE-BRTE/ANNUALS. State 2.

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

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

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

**Table 9. Ground cover**

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

**Additional community tables**

**Animal community**

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides a sparse plant community for select native wildlife species. The plant community exhibits low diversity and productivity of grasses, forbs, and shrubs. Mule deer and antelope are the large herbivores using the site during spring and winter months. The site provides seasonal habitat for resident and migratory animals including sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Area sensitive species may include burrowing owl, Great Basin ground squirrel, long-nosed snake, groundsnake, Great Basin collared lizard, Townsend pocket gopher, and sage-grouse. Encroachment of noxious and invasive plant species (cheatgrass, Russian thistle and kochia) in isolated areas can replace native plant species which provide critical feed, brood-rearing, and nesting cover for a variety of native wildlife. Water features are sparse provided by seasonal streams, artificial water catchments, and springs.

State 1 Phase 1.1 – Winterfat/ Bud Sagebrush/ Indian Ricegrass/ Bottlebrush Squirreltail/ Thurber Needlegrass Reference Plant Community (RPC) This plant community provides a diversity of grasses, forbs, and shrubs, used throughout the growing season by native insect communities that assist in pollination. The reptile community is represented by leopard lizard, sagebrush lizard, and short horned lizard. Sage-grouse may utilize the site for brood-rearing habitat. The plant community provides forage throughout the year for large mammals including mule deer and antelope. Winterfat is a good to fair feed for deer and is eaten readily by elk on the few sites where it occurs at high elevations. It is utilized extensively by rodents, rabbits, birds, and antelope. Bud sagebrush provides important spring forage for antelope and mule deer. Rodent populations can be high and provide an excellent prey base for raptors.

State 1 Phase 1.2 – Sandberg Bluegrass/ Winterfat Plant Community: This plant community is the result of improper grazing and lack of fire. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. If rabbitbrush is present patches may begin to provide limited vertical structure for wildlife. Insect diversity would be reduced but native forbs are still present and would support select pollinators. The reptiles including short horned lizard and sagebrush lizard would be limited or excluded due to the loss of sagebrush. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer and antelope) use for forage would be limited to herbaceous vegetation in the spring and fall. The loss of bud sagebrush and reduction of winterfat would reduce the quality of the habitat for mule deer and antelope. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

State 1 Phase 1.3- Indian Ricegrass/ Sandberg Bluegrass Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. Where rabbitbrush and Gardner saltbush are present re-sprouting may occur adding vertical structure over time. The forbs present would be similar to Phase A. Diversity of insects would be reduced due to the loss of winterfat and sagebrush. The reptile community would be reduced or eliminated due to the loss of sagebrush. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). The loss of winterfat and bud sagebrush would lower the quality of habitat for mule deer and antelope. Indian ricegrass provides excellent early spring feed for mule deer and antelope. Small mammal populations may be reduced with the loss of cover and enhanced predator hunting success.

State 2 – Sandberg Bluegrass/ Cheatgrass / Annuals Plant Community:

This state has developed due to frequent fires with or without improper grazing management. The reduced forbs and shrub component in the plant community would support a very limited population of pollinators. The loss of native forbs may reduce butterfly larval habitat due to host specific needs of the butterfly. Most reptilian species are not supported with food, water, or cover. This plant community does not provide the habitat requirements for sage-grouse. Diversity of grassland avian species is reduced due to poor cover and available food. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large mammals may utilize the herbaceous vegetation in the early part of the year when the invasive annuals (cheatgrass) are more palatable. At other times of the year large mammals would not regularly utilize these areas due to poor food and cover conditions. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

Grazing Interpretations.

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.

This site is suited for grazing by domestic livestock in late spring, fall, and winter.

## **Hydrological functions**

Soils on this site are in hydrologic group C. They have moderately high runoff potential.

## **Recreational uses**

This site offers little value for recreation and aesthetics.

## **Wood products**

None

## **Other products**

None

## Other information

### Field Offices

Meridian, ID  
Caldwell, ID  
Mountain Home, ID  
Marsing, ID  
Payette, ID  
Weiser, ID  
Emmett, ID

## Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Those involved in developing this site description include:

Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC  
Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC  
Jim Cornwell, Range Management Specialist, IASCD  
Dan Ogle, Acting State Rangeland Management Specialist, NRCS, Idaho  
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho  
Leah Juarros, Resource Soil Scientist, NRCS, Idaho  
Lee Brooks, Range Management Specialist, IASCD

## Type locality

Location 1: Ada County, ID	
Township/Range/Section	T2S R1E S33
Location 2: Elmore County, ID	
Township/Range/Section	T4S R4E S33

## Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number "35".  
USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.  
USDA, NRCS.2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.  
USDA, Forest Service, Fire Effects Information Database. 2004. [www.fs.fed.us/database](http://www.fs.fed.us/database).  
USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; Version 4-2005.

## 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

- 1. Number and extent of rills:** rills rarely occur on this site due to relatively flat slopes. When they do occur, they are on slopes greater than 10 percent.

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- 2. Presence of water flow patterns:** water-flow patterns rarely occur on this site due to relatively flat slopes. When they do occur, they are on slopes greater than 10 percent.

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- 3. Number and height of erosional pedestals or terracettes:** both 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):** data is not available. On sites in mid-seral status, bare ground may range from 60-80 percent.

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- 5. Number of gullies and erosion associated with gullies:** none.

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- 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.

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- 7. Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move up to 3 feet, primarily by wind. 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):** 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):** structure ranges from moderate to strong medium platy. Soil organic matter (SOM) is 0.5 to 1 percent. The A or A1 horizon is typically 5 inches thick.

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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. Medium shrubs can catch snow in the interspaces.
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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):** 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: medium shrubs
- Sub-dominant: cool season deep-rooted perennial bunchgrasses
- Other: perennial forbs
- Additional:
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** very little mortality and decadence occurs on this site. Shallow rooted bunchgrasses may suffer mortality during extended periods of drought.
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14. **Average percent litter cover (%) and depth ( in):** additional litter cover data is needed but is expected to be 5-20 percent to a depth of <0.1 inches. Under mature shrubs litter is <0.5 inches deep and is 90-100 percent ground cover.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 500 pounds per acre (555 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 20-30 percent of the total production, forbs 5-10 percent, and shrubs 60-70 percent.
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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** includes cheatgrass, *Vulpia* sp., annual mustards, halogeton, Russian thistle, and annual Kochia.
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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in favorable years.
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