

Ecological site R011XB017ID Loamy 6-8 PZ ATCO/ACHY

Last updated: 4/06/2020
Accessed: 05/10/2025

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: 6-8" 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

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 sandy loam to loam 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

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex confertifolia</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i>

Physiographic features

This site occurs on nearly level alluvial fans with slopes of 0-2 percent. Elevations range from 4200-5500 feet (1250-1650 meters). This site often has gravel pavement on the soil surface.

Table 2. Representative physiographic features

Landforms	(1) Outwash fan
Flooding frequency	None
Elevation	4,200–5,500 ft
Slope	0–2%
Water table depth	60 in
Aspect	Aspect is not a significant factor

Climatic features

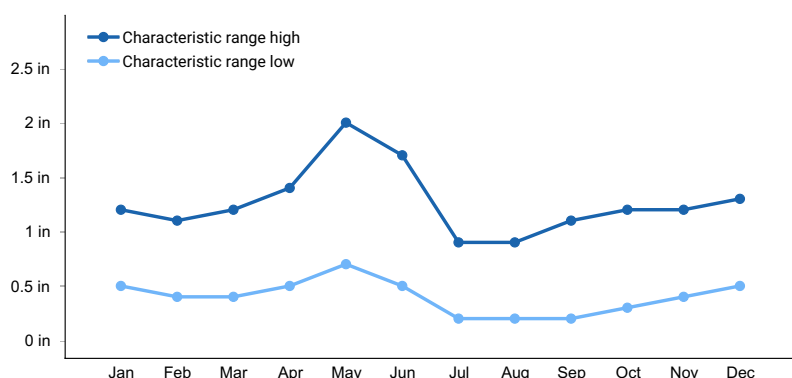
The Upper Snake River Plain, MLRA 11B, is part of the Northwestern Wheat and range Region. It has a mean elevation of 4841 feet above sea level, and varies from 4177 to 4841 feet. In general, it is a geologically young, level to gently sloping lava plateau. In places larger streams have cut deep, steep-walled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

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

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

Table 3. Representative climatic features

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

**Figure 1. Monthly precipitation range**

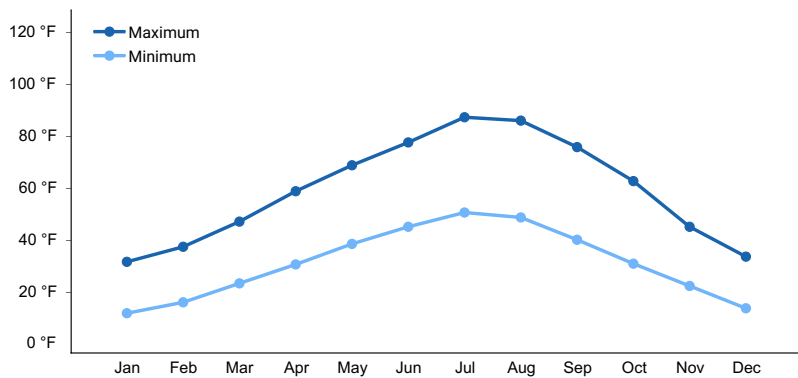


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils supporting this site are very deep, well drained, and have rapid to very rapid permeability. Subsoil textures below about 14 inches are generally very gravelly to extremely gravelly sandy loams or sands. The soils are usually calcareous and moderately alkaline. The available water holding capacity (AWC) is low. Surface runoff is slow and the erosion hazard is slight. These soils are characterized by limited AWC and an arid moisture regime.

Soil Series Correlated to this Ecological Site

Whiteknob

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Very gravelly
Drainage class	Somewhat excessively drained
Permeability class	Rapid to very rapid
Soil depth	60 in
Surface fragment cover <=3"	4–27%
Surface fragment cover >3"	0–10%
Available water capacity (0-40in)	1.3–3.3 in
Calcium carbonate equivalent (0-40in)	10–20%
Electrical conductivity (0-40in)	2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	30–60%
Subsurface fragment volume >3" (Depth not specified)	5–55%

Ecological dynamics

The dominant visual aspect of this site is low growing salt desert shrubs dominated by shadscale saltbush. Composition by weight is approximately 30-40 percent grasses, 5-10 percent forbs, and 50-70 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 shadscale saltbush and Indian ricegrass. Subdominants include needle and thread grass, Gardner saltbush, and winterfat. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 300 pounds per acre (336 kilograms per hectare) in a normal year. Production in a favorable year is 550 pounds per acre (616 kilograms per hectare). Production in an unfavorable year is 150 pounds per acre (168 kilograms per hectare). Structurally, medium shrubs are dominant, followed by cool season deep rooted bunchgrasses, followed by perennial forbs.

FUNCTION:

This site is suited for grazing by domestic livestock in spring and early summer. Some grazing can occur in winter due to generally light snow cover however, temperatures may be cold. This site provides fair habitat for pronghorn antelope, sage grouse, and predators. The site offers little value for recreation or aesthetics.

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

Impacts on the Plant Community.

Influence of fire:

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), bud sagebrush is reduced significantly. With continued short fire frequency, bud sagebrush can be completely eliminated along with many of the desirable understory species such as bottlebrush squirreltail and Indian ricegrass. Shrubs such as shadscale saltbush, Gardner saltbush, rabbitbrush, and broom snakeweed 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. This type of management leads to reduced vigor of the bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in Rabbitbrush 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 over time can maintain the integrity of the plant community.

Weather influences:

Above normal precipitation in late 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 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 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 shrubs 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.

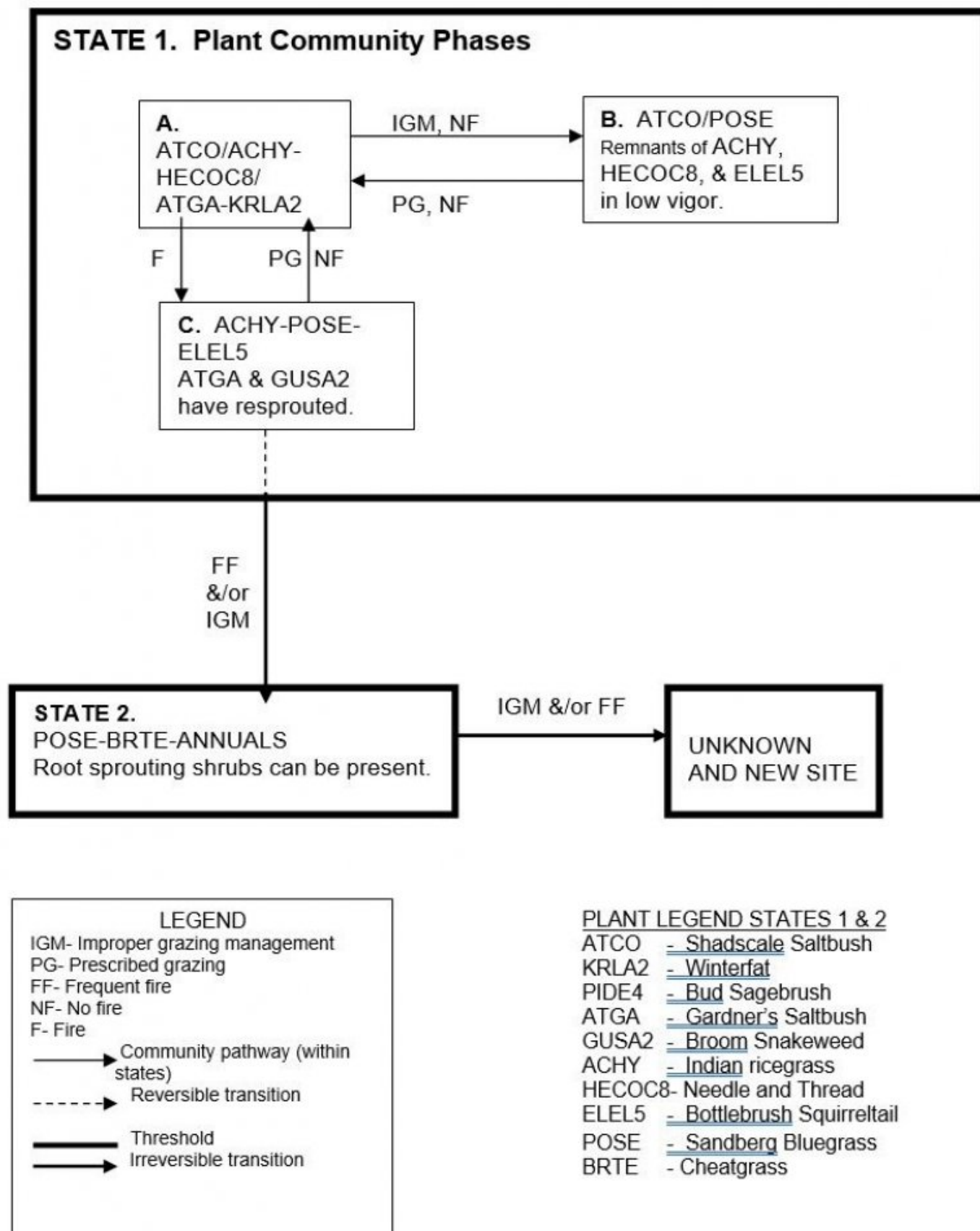
State 1 Phase C to State 2. Develops through frequent fire and/or improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

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. Areas of heavy broom snakeweed infestation may offer control opportunities using chemical applications.

State and transition model



State 1
State 1 Phase A

Community 1.1
State 1 Phase A

This plant community has shadscale saltbush in the overstory with Indian ricegrass dominating the understory. Gardner saltbush, winterfat, and bud sagebrush are often present in the community in smaller amounts. Other significant species in the plant community are needle and thread grass, bottlebrush squirreltail, sand dropseed, plains prickly pear, and scarlet globemallow. 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%

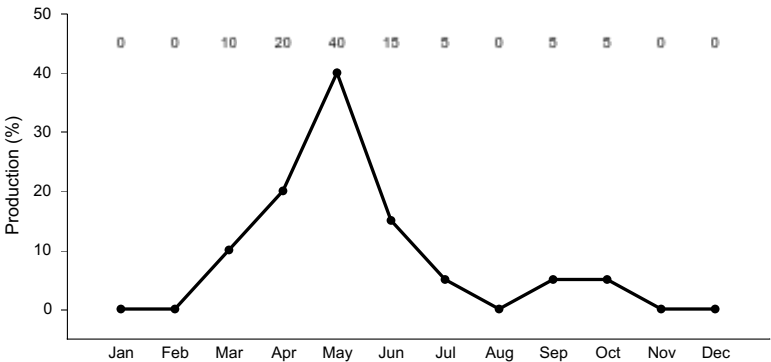


Figure 3. Plant community growth curve (percent production by month). ID0601, ATCO/ACHY. State 1.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

This plant community is dominated by shadscale saltbush with Sandberg bluegrass in the understory. This state has developed due to improper grazing management and lack of fire. There are remnants of Indian ricegrass, needle and thread grass, and bottlebrush squirreltail. These deep-rooted perennial bunchgrasses 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%

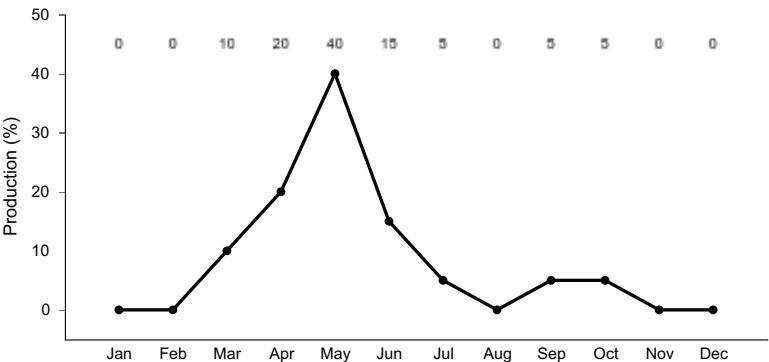


Figure 4. Plant community growth curve (percent production by month).
ID0601, ATCO/ACHY. State 1.

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 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%
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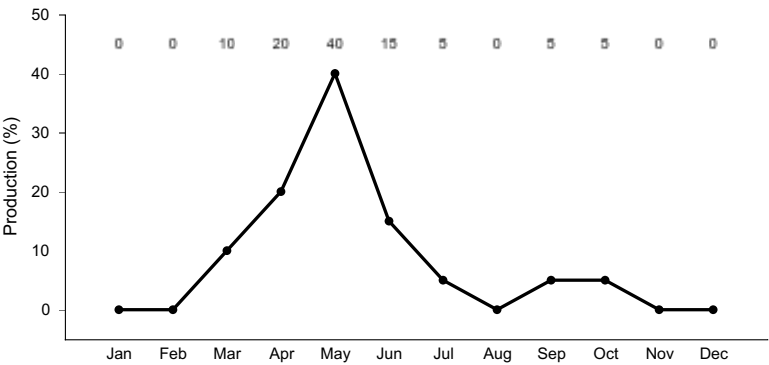


Figure 5. Plant community growth curve (percent production by month). ID0601, ATCO/ACHY. State 1.

State 4
State 2

Community 4.1
State 2

This plant community is dominated by Sandberg bluegrass, cheatgrass, and other annuals. Root sprouting shrubs such as 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 fire and/or 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%

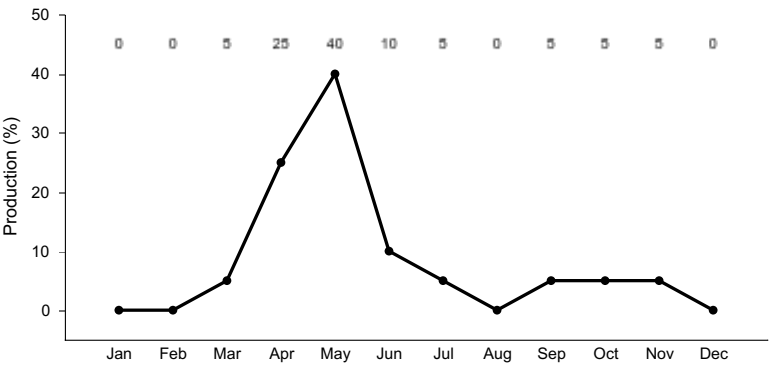


Figure 6. Plant community growth curve (percent production by month).

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 habitat for select native wildlife species that can tolerate a sparse plant community. The plant community exhibits a sparse mixture of forbs offering pollinator habitat for invertebrates. Mule deer and antelope are the large herbivores using the site. 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. Encroachment of noxious and invasive plant species (cheatgrass) in isolated areas can replace native plant species. Water features are sparse provided by seasonal streams, artificial water catchments, and springs.

State 1 Phase 1.1 – Shadscale/ Indian Ricegrass/ Needle and Thread/ Gardner's Saltbush/ Winterfat 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 and short horned lizard. 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. Winterfat 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. Shadscale is used mostly during winter and spring for browse. The fruits provide food for game birds and songbirds. The seeds of shadscale remain on the plant throughout the winter, enhancing its nutritional value. Rodent populations can be high and provide an excellent prey base for raptors.

State 1 Phase 1.2 - Shadscale/ Sandberg Bluegrass Plant Community: This phase has developed due to improper

grazing management and lack of fire. An increase in canopy cover of shadscale contributes to a sparse herbaceous understory. The reduced herbaceous understory results in reduced diversity and numbers of insects. The reptile community is represented by leopard lizard and short horned lizard. The reduction of grasses and forbs in the plant community would reduce the available prey species and cover for these resident reptiles. Fewer prey species and sparse understory cover results in limited food, brood-rearing, and nesting habitat for birds. Shadscale is used mostly during winter and spring for browse for mule deer. The fruits provide food for game birds and songbirds. The seeds of shadscale remain on the plant throughout the winter, enhancing its nutritional value

State 1 Phase 1.3- Indian Ricegrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This phase has developed due to fire. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. Patches of root sprouting shrubs (rabbitbrushes) may begin to provide limited vertical structure for wildlife. Insect diversity would be reduced but native forbs are still present and support select pollinators. The reptiles including short horned lizard would be limited or excluded due to the loss of brush. 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 winterfat and shadscale would reduce the value of the site as large game winter habitat. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

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

Frequent fires and/or improper grazing management have caused the degradation from either Phase 1.2 or 1.3 in State 1. The reduced forb and shrub component in the plant community would support a very limited population of pollinators. Most reptilian species are not supported with food, water, or cover. 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 spring and early summer. Some grazing can occur in winter due to generally light snow cover, however, temperatures may cold.

Hydrological functions

Soils on this site are in hydrologic group B. They have moderately low runoff potential.

Recreational uses

This site offers little value for recreation and aesthetics. Some hunting for pronghorn antelope occurs on this and adjacent sites.

Wood products

None

Other products

None

Other information

Field Offices

Burley, ID
Shoshone
American Falls, ID
Pocatello, ID
Blackfoot, ID
Arco, ID
Rexburg, ID
St. Anthony, ID
Rigby, ID
Fort Hall, ID
Idaho Falls, 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
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: Jefferson County, ID	
Township/Range/Section	T7N R32E S3

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.
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

DF

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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Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	04/02/2008
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 and gravelly surface.

2. **Presence of water flow patterns:** water-flow patterns rarely occur on this site due to relatively flat slopes and gravelly surface.

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

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.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** blowouts and depositional areas are usually not present. Immediately following wildfire some soil movement may occur on lighter textured soils.

7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move up to 3 feet primarily by wind. Coarse litter generally does not move.

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

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure typically includes weak thin and moderate thick platy and weak fine and moderate fine granular structure. Soil organic matter (SOM) ranges from 1 to 2 percent. The surface horizon is typically 2 to 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.
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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):** is 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: 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):** little mortality or plant 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 300 pounds per acre (336kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 30-40 percent of the total production, forbs 5-10 percent and shrubs 50-70 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, 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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