

Ecological site R011XB018ID Shallow Sandy 8-12 PZ ARNO4/ACHY-HECOC8

Last updated: 4/06/2020
Accessed: 04/28/2024

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: 8-12” 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

Not saline or saline sodic
Shallow, with <35% coarse fragments (by volume), not skeletal
not strongly or violently effervescent in the surface mineral 10”
Surface textures range from loamy sand to fine sandy 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

R011XA014ID	Sandy 8-14 PZ ARTRT/HECOC8-ACHY
R011XB013ID	Shallow Loamy 8-12 PZ ARAR8/PSSPS
R011XB019ID	Loamy 7-10 PZ ARTRW8/HECOC8-ACHY

Similar sites

R011XB013ID	Shallow Loamy 8-12 PZ ARAR8/PSSPS
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Table 1. Dominant plant species

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

Physiographic features

This site occurs on nearly level to rolling fans and side slopes of buttes. Slopes range from 2 to 30 percent. Elevations range from 4200-5000 feet (1250-1550 meters). These are areas where sands from dunes or old lake sediments have been blown over the pre-existing landscape.

Table 2. Representative physiographic features

Landforms	(1) Hill
Elevation	1,280–1,524 m
Slope	2–30%

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)	330 mm

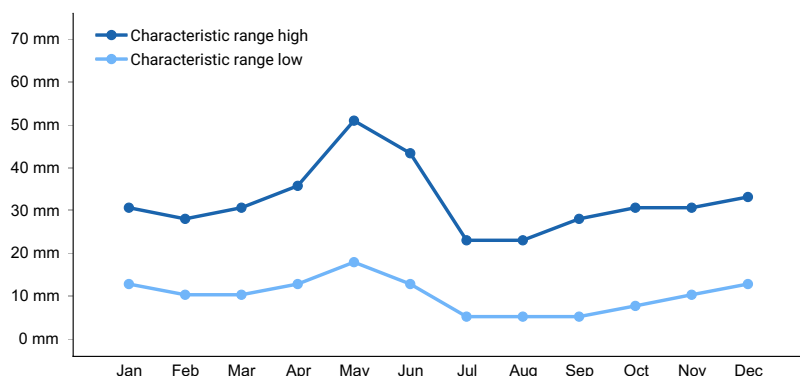


Figure 1. Monthly precipitation range

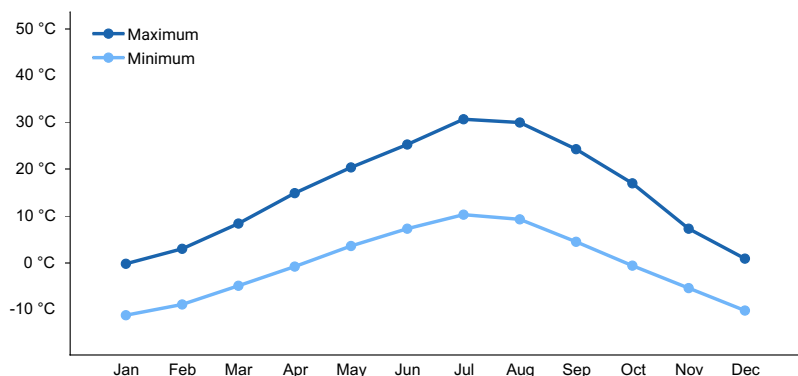


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils on this site are generally shallow loamy sands to basalt bedrock at approximately 18 inches. The soils are calcareous throughout the profile. Permeability is moderately rapid, surface runoff is medium and hazard of erosion is moderate to high. Available water capacity is low.

Ecological dynamics

The dominant visual aspect of this site is Indian ricegrass, needle and thread, and black sagebrush with a scattering of taller shrubs. Composition by weight is approximately 50-60 percent grass, 10-20 percent forbs, and 25-35 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by warm, dry summers and cold, wet winters. Herbivory has historically occurred on the site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, sage grouse, lagomorphs, and small rodents. Fire has historically occurred on this site every 80 to 100 years. Fire occurs only in years with above normal precipitation.

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 Indian ricegrass, needle and thread, and black sagebrush. Subdominants include thickspike wheatgrass, Nevada bluegrass, bottlebrush squirreltail, and arrowleaf balsamroot. Scattered Wyoming big sagebrush and basin big sagebrush occur in areas where the soil is deeper or where cracks occur in the basalt bedrock. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 450 pounds per acre (504 Kg/ha) in a normal year. Production in a favorable year is 550 pounds per acre (616 Kg/ha). Production in an unfavorable year is 200 pounds per acre (224 Kg/ha). Structurally, cool season deep rooted perennial bunchgrasses are very dominant, followed by medium height shrubs being more dominant than perennial forbs while shallow rooted bunchgrasses and tall shrubs are subdominant.

FUNCTION:

This site provides fair to good habitat for various upland wildlife including sage grouse, pronghorn antelope, and mule deer. It is best suited for livestock use in the spring, fall, and early winter. The site has limited value for recreation and natural beauty. Some hunting of sage grouse and pronghorn antelope does occur. Occasional use by other upland wildlife may occur providing some aesthetic value.

Due to the low production potential and easy access by animals this site is easily degraded by improper grazing

management or frequent fires. Infiltration can be good with a mixed stand of shrubs and perennial grasses. Runoff, when it does occur, is non-erosive except during high intensity convection storms. Snow is caught in the shrub interspaces and a mixed stand of shrubs and perennial grasses is necessary to reach potential of the site. If vegetative cover is removed, the potential for wind erosion is high.

Impacts on the Plant Community.

Influence of fire:

This site historically had a very low fire frequency, approximately every 80-100 years. Most of the shrubs evolved in the absence of fire, therefore they can be severely damaged or killed when burned. Cheatgrass can be a troublesome invader on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency. Root-sprouting shrubs such as horsebrush and rabbitbrush will increase after fire.

Influence of improper grazing management

Black sagebrush, winterfat, and spiny hopsage can all be impacted by improper grazing management. Relatively low levels of utilization by cattle and sheep are needed to maintain the shrub component.

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

Continued improper grazing management influences fire frequency by increasing fine fuels. As cheatgrass increases fires become more frequent.

Proper grazing management can maintain the integrity of the plant community.

Weather influences:

Extended periods of drought significantly impact this site due to the shallow soil and low water holding capacity. Extended drought reduces vigor of the perennial grasses and palatable shrubs. Extreme drought may cause plant mortality.

Influence of insects and disease:

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:

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. Cheatgrass can be invasive on this site, especially after fire. Once it becomes established the fire frequency increases. As a result, the shrub component can be lost.

Influence of wildlife:

Relatively low numbers of wildlife use this site and have little impact on it. Pronghorn antelope is the dominant large herbivore using the site. They use the site yearlong but prefer it in the spring, fall, and early winter. Sage grouse use the site for strutting grounds and they may also use the site during the winter. Winter and spring use by mule deer occasionally occurs.

Watershed:

Decreased infiltration and increased runoff occurs when black sagebrush is removed with frequent fires, particularly the year following the fire event. The increased runoff also increases wind, 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 fire (approximately every 80-100 years). Fire only occurs in above normal precipitation (favorable) years.

Phase A to C. Develops under improper grazing management and no fire.

Phase C to A. Develops under a good prescribed grazing management program and no fire.

Phase B to A. Develops from prescribed grazing and no fire.

State 1 to State 2.

Develops from Phase B with frequent fire or from Phase C with improper grazing management and fire. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

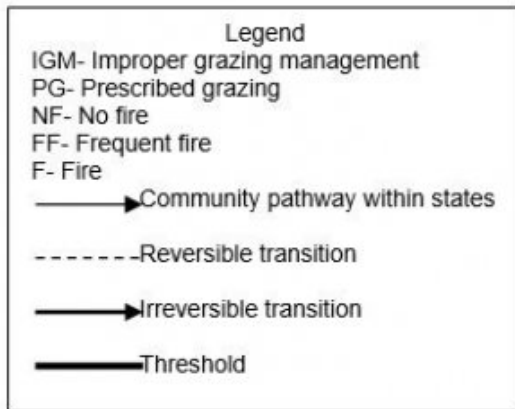
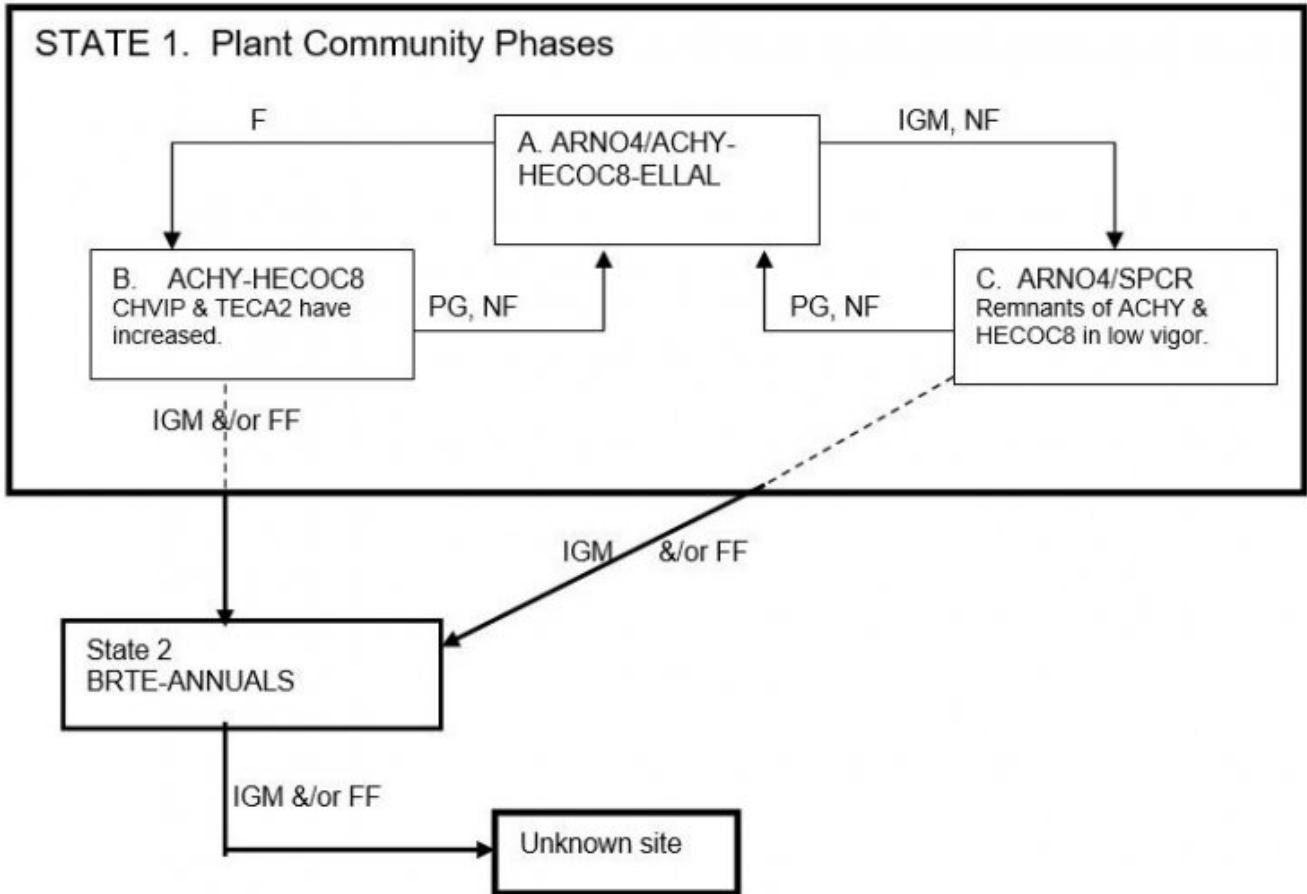
State 2 to Unknown Site.

The site has deteriorated further and soil loss has occurred resulting in a loss of site potential. This has resulted from improper grazing management and frequent fires. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

Practice Limitations.

Slight to moderate limitations exist for implementing both vegetative management and facilitating practices due to shallow, sandy soils and low precipitation. Moderate to severe limitations exist for implementing accelerating practices due to shallow soils and unfavorable moisture conditions. Since many of the shrubs on the site are palatable, brush management is usually not recommended on this site.

State and transition model



PLANT LEGEND STATES 1 & 2

- ARNO4 - Black Sagebrush
- CHVIP4 - Twisted Leaf Green Rabbitbrush
- TECA2 - Gray Horsebrush
- ACHY - Indian Ricegrass
- HECOC8- Needle and Thread
- ELLAL - Thickspike Wheatgrass
- SPCR - Sand Dropseed
- BRTE - Cheatgrass

**State 1
State 1 Phase A**

**Community 1.1
State 1 Phase A**

State 1. Phase A. Reference Plant Community Phase. This plant community is dominated by Indian ricegrass, needle and thread, and black sagebrush. Thickspike wheatgrass is sub-dominant. Small amounts bottlebrush squirreltail, arrowleaf balsamroot, and Nevada bluegrass may be present. A large variety of forbs are present but each represents a small amount in the community. Other shrubs such as tall rabbitbrush, Wyoming big sagebrush, basin big sagebrush, gray horsebrush, and low green rabbitbrush can be present in small amounts. The natural fire frequency is about 80-100 years.

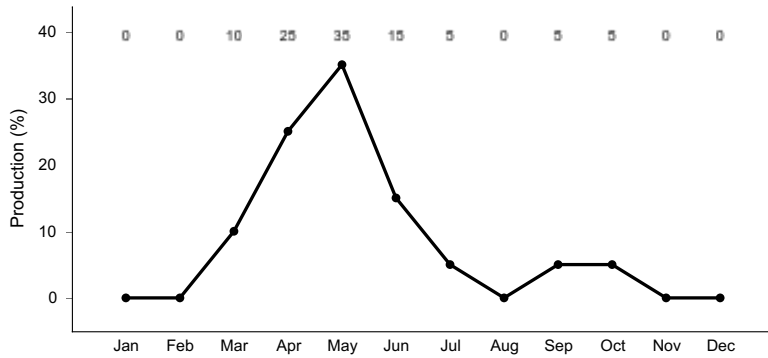


Figure 3. Plant community growth curve (percent production by month). ID0610, ARNO4/ACTH7/PSSPS. State 1.

**State 2
State 1 Phase B**

**Community 2.1
State 1 Phase B**

State 1. Phase B. This plant community is dominated by Indian ricegrass and needle and thread. Small amounts of thickspike wheatgrass, bottlebrush squirreltail, Nevada bluegrass, and a variety of forbs are present. Root-sprouting shrubs such as rabbitbrush and gray horsebrush have increased and some annual grasses have invaded. This phase has developed due to fire.

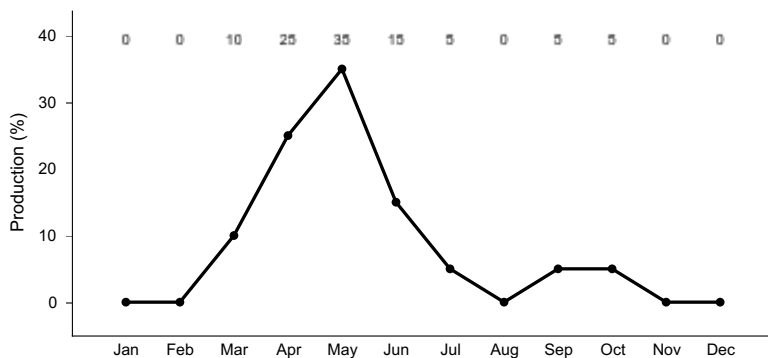


Figure 4. Plant community growth curve (percent production by month). ID0610, ARNO4/ACTH7/PSSPS. State 1.

**State 3
State 1 Phase C**

**Community 3.1
State 1 Phase C**

State 1, Phase C. This plant community is dominated by black sagebrush with sand dropseed in the understory. Indian ricegrass, needle and thread and other deep-rooted perennial bunchgrasses are present but in reduced amounts and in low vigor. Some annual grasses have invaded. This phase has developed due to improper grazing management and no fire.

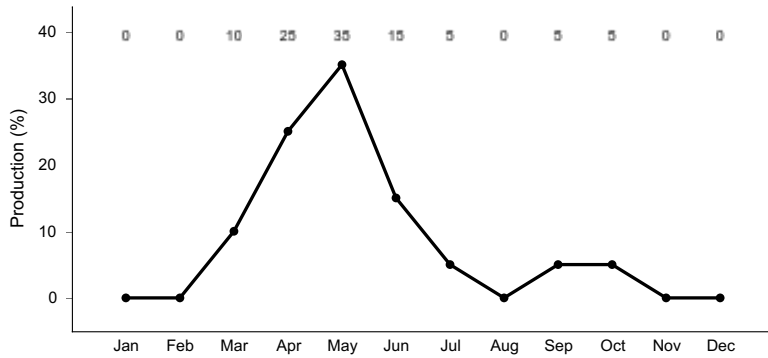


Figure 5. Plant community growth curve (percent production by month). ID0610, ARNO4/ACTH7/PSSPS. State 1.

State 4
State 2

Community 4.1
State 2

State 2. This plant community is dominated by cheatgrass and a variety of forbs. Some perennial forbs are present. The community has developed due to continued improper grazing management and fire from Phase C, State 1 and with frequent fire from Phase B, State 1. Some soil loss has occurred. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

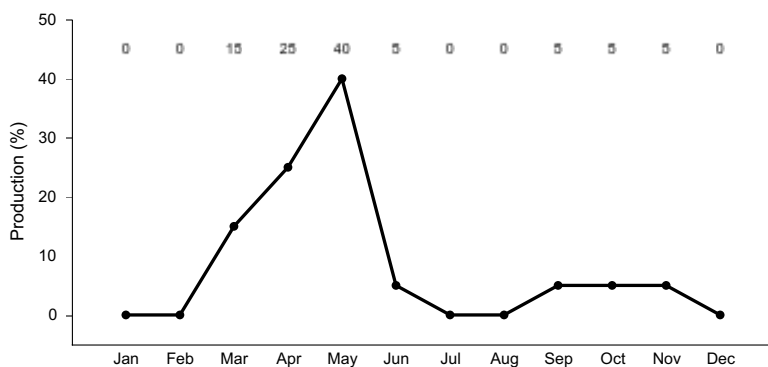


Figure 6. Plant community growth curve (percent production by month). ID0611, POSE/ BRTE/ ANNUALS . State 2.

State 5
State 3

Community 5.1
State 3

Unknown 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 community has developed due to continued improper grazing management and/or fire. It is not economical to return this site to State 1 with accelerating practices.

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 diverse mixture of forbs throughout the short growing season offering excellent 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 western toad, sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Sage-grouse, an area sensitive species, may utilize the plant community for nesting, winter cover, and winter food. Encroachment of noxious and invasive plant species (cheatgrass) 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 –Black Sagebrush/ Indian Ricegrass/ Needle and Thread/ Thickspike Wheatgrass 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 and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western toad, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Sage-grouse may utilize this plant community for nesting and winter habitat. The plant community provides forage for large mammals including mule deer and antelope. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots would utilize this community.

State 1 Phase 1.2 –Indian Ricegrass/ Needle and Thread/ Twisted Leaf Green Rabbitbrush/Gray Rabbitbrush Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. Patches of root sprouting shrubs (rabbitbrushes) begin to provide limited vertical structure for wildlife. Insect diversity would be reduced but native forbs are still present and support select pollinators. Reptiles including short horned lizard and sagebrush lizard would be limited or excluded due to the loss of sagebrush. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collected all available water would exclude the use of amphibians on these sites. Sage-grouse use for winter cover and winter food is eliminated. 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 populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

State 1 Phase 1.3- Black Sagebrush/ Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. The reduced herbaceous understory results in reduced diversity and numbers of insects. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, and western toad. The reduction of grasses and forbs in the plant community would reduce the available prey species and cover for these resident reptiles. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collected all available water would exclude the use of amphibians on these sites. Fewer prey species and sparse understory cover result in limited food, brood-rearing, and nesting habitat for birds. Winter cover and winter food for sage-grouse is available. Reduced understory vegetation and increased sagebrush density reduces forage value for mule deer and antelope. A small mammal population including golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots would utilize these areas.

State 2 - Cheatgrass / Annuals Plant Community:

This plant community is the result of continued improper grazing management and frequent fire. Invasive herbaceous plants and patches of root sprouting shrubs like rabbitbrushes can be present. 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. This plant community does not meet 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.

It is best suited for livestock use in the spring, fall, and early winter.

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 D. They have high runoff potential.

Recreational uses

The site has limited value for recreation and natural beauty. Some hunting of sage grouse and pronghorn antelope does occur. Occasional use by other upland wildlife may occur providing some aesthetic value.

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	
General legal description	West slope of Table Butte.

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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Date	04/23/2009
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 the sandy surface and relatively high intake rate.

- 2. Presence of water flow patterns:** water-flow patterns rarely occur on this site. When they do occur they are short and disrupted by cool season grasses and shrubs. They are not extensive.

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** ranges from 60-80 percent but additional data is needed.
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5. **Number of gullies and erosion associated with gullies:** gullies do not occur on this site.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** usually does not occur. Some wind erosion may occur immediately following a wildfire or if the plant cover is removed mechanically. Active dunes may occur as inclusions within the site but are never a part of the site.
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7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move up to 2 feet or further on slopes greater than 10 percent following a significant run-off event. Coarse litter generally does not move.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** values should range from 2 to 4 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):** No data.
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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. Shrubs accumulate snow in the interspaces. Terracettes, although rare, provide a favorable micro-site for vegetation establishment which further increases infiltration.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** 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: cool season deep-rooted perennial bunchgrasses
- Sub-dominant: medium shrubs
- Other: perennial forbs
- Additional: shallow rooted grasses tall shrubs
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** very little mortality or decadence is expected on this site. Mortality of shallow rooted grasses may occur due to extended periods of drought.

14. **Average percent litter cover (%) and depth (in):** additional data is needed but is expected to be low and at a shallow depth.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 450 pounds per acre (504 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 50-60 percent of the total production, forbs 10-20 percent, and shrubs 25-35 percent.

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

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