USDA Natural Resources
Conservation Service

Ecological site R011XB007ID
Loamy 12-16 PZ ARTRT/LECI4

Last updated: 4/06/2020
Accessed: 05/11/2025

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: 12-16” 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”
Textures range from sandy loam to silt 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

R011XB010ID	**Loamy 12-16 PZ ARTRW8/PSSPS**
R011XY015ID	**Loamy Bottom 8-14 PZ ARTRT/LECI4**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. tridentata*
Herbaceous	(1) *Leymus cinereus*

Physiographic features

This site occurs on nearly level flats, benchlands, plateaus, buttes, and on rolling and somewhat broken foothills on volcanic landforms. Slopes predominantly range from 5-30 percent. Small lava rock outcrop areas may be scattered throughout the site. Elevation ranges from 4000-5500 feet (1200-1680 m). This site often occurs as mounds

occurring in the Loamy 12-16” ARTRW8/ PSSPS site.

Table 2. Representative physiographic features

Landforms	(1) Lava plain (2) Hill (3) Lava plateau
Flooding frequency	None
Ponding frequency	None
Elevation	4,000–5,500 ft
Slope	5–30%
Water table depth	60 in
Aspect	N, S, W

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

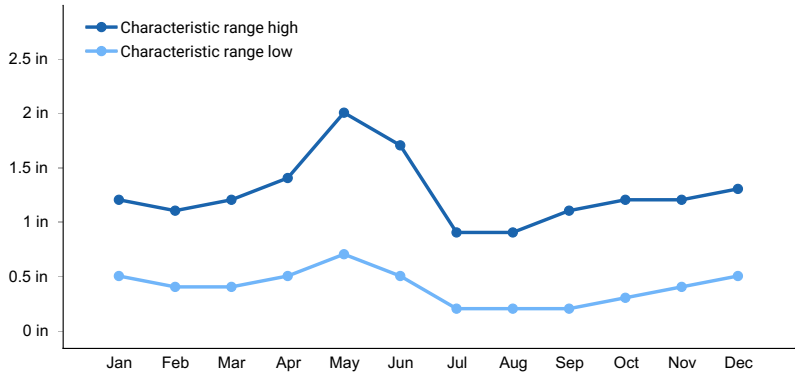


Figure 1. Monthly precipitation range

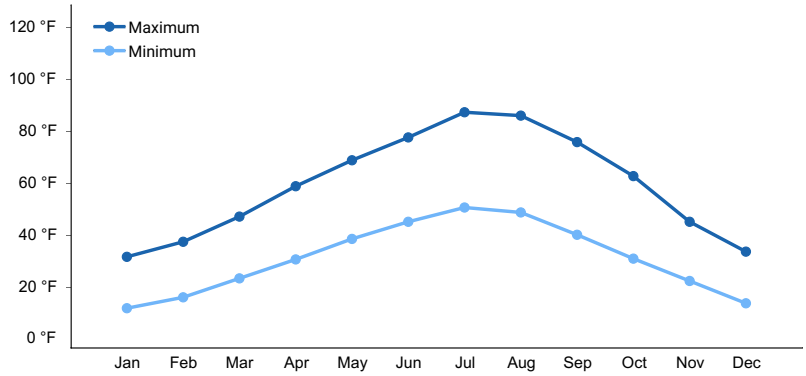


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils supporting this site are deep to very deep, well drained, with moderate to moderately slow permeability above the bedrock. Runoff is low to high. The erosion hazard is slight to high by water and slight to high by wind. The available water holding capacity (AWC) is high to very high. These soils are usually 40 to more than 60 inches to bedrock. Where the site occurs near lava flows, the soils are high in ash and 0 to 10 percent cinders. The ash will somewhat increase the productivity. The surface texture is medial loam, silt loam, or loam with few or no surface stones. The subsoil is usually slightly to moderately well developed with clay ranging from approximately 5 to 26 percent. Lime is leached to below 15 inches except on the mounds where it seems to be churned. On the mounds lime is present to the surface. Where the vegetative cover is removed the erosion hazard can be high, especially on the soils high in ash.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Silt loam
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	40–60 in
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	6–11 in
Calcium carbonate equivalent (0-40in)	0–30%
Electrical conductivity (0-40in)	0–1 mmhos/cm
Sodium adsorption ratio (0-40in)	0–3
Soil reaction (1:1 water) (0-40in)	6.5–8.6
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

Ecological Dynamics of the Site:

The dominant visual aspect of this site is basin wildrye and basin big sagebrush. Composition by weight is approximately 65-75 percent grasses, 10-20 percent forbs, and 10-20 percent shrubs.

During the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold, wet winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, and lagomorphs.

Fire has historically occurred on the site at intervals of 20-50 years.

The Historic Climax Plant Community (HCPC) moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The HCPC is Phase A. This plant community is dominated by basin big sagebrush and basin wildrye. Subdominant species include bluebunch wheatgrass, Nevada bluegrass, arrowleaf balsamroot, lupine, and tapertip hawksbeard. A wide variety of other grasses, forbs, and shrubs occur in small amounts. The plant species composition of Phase A is listed later under “HCPC Plant Species Composition”.

Total annual production is 1200 pounds per acre (1344 kilograms per hectare) in a normal year. Production in a favorable year is 1500 pounds per acre (1680 kilograms per hectare). Production in an unfavorable year is 600 pounds per acre (672 kilograms per hectare). Structurally, cool season deep-rooted perennial bunchgrasses are dominant, followed by shrubs and forbs being equal followed by shallow rooted bunchgrasses.

FUNCTION:

This site is suited for grazing by domestic livestock in the spring, summer, and fall. If water is available, the site is easily grazed by livestock due to the gentle slopes.

This site has limited value for recreation.

Due to the relatively flat slopes and non-stony surface, 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, basin big sagebrush increases. Grasses and forbs decrease as shrubs increase

When fires become more frequent than historic levels (20-50 years), basin big sagebrush is reduced significantly. With continued short fire frequency, basin big sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass, Nevada bluegrass and Thurber’s needllegrass. Basin wildrye is normally stimulated by fire, however when fire becomes an annual or semi-annual event, its vigor will be reduced. These species may be replaced by cheatgrass, medusahead, and/or bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive species. These fine fuels will increase the fire frequency. Root sprouting shrubs such as rabbitbrush and gray horsebrush will increase.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. Spring grazing of basin wildrye in consecutive years should be avoided. This type of management leads to reduced vigor of it and the other bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in basin big sagebrush and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels. As cheatgrass and/or medusahead increase along with other annuals, fires become more frequent.

Proper grazing management that addresses frequency, duration, and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in basin big sagebrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned as a reduction in shrubs without a suitable understory of perennial grasses can lead to increases in cheatgrass and/or medusahead which will then lead to more frequent fire intervals.

Weather influences:

Above normal precipitation in April, May and June can dramatically increase total annual production of the plant community. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Likewise, below normal precipitation during these spring months can significantly reduce total annual production and be detrimental to viable seed production. Overall plant composition is normally not affected when perennials have good vigor.

Below normal temperatures in the spring can have an adverse impact on total production regardless of precipitation. An early, hard freeze can occasionally kill some plants.

Prolonged drought adversely affects this plant community in several ways. Vigor, recruitment, and production are usually reduced. Mortality can occur. Prolonged drought can lead to a reduction in fire frequency.

Influence of insects and disease:

An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available. 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 and perennial invasive species with deep root systems 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 late spring, summer, and fall. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

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

Plant Community and Sequence:
Transition pathways between common vegetation states and phases:

State 1.
Phase A to B. Develops with improper grazing management and in the absence of fire.
Phase A to C. Develops with fire.
Phase B to A. Develops with prescribed grazing and brush management.
Phase C to A. Develops with prescribed grazing and no fire.

State 1 Phase C to State 2. Develops through frequent fire or improper grazing management. The site has crossed

the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

State 2 to 3. Results from range seeding.

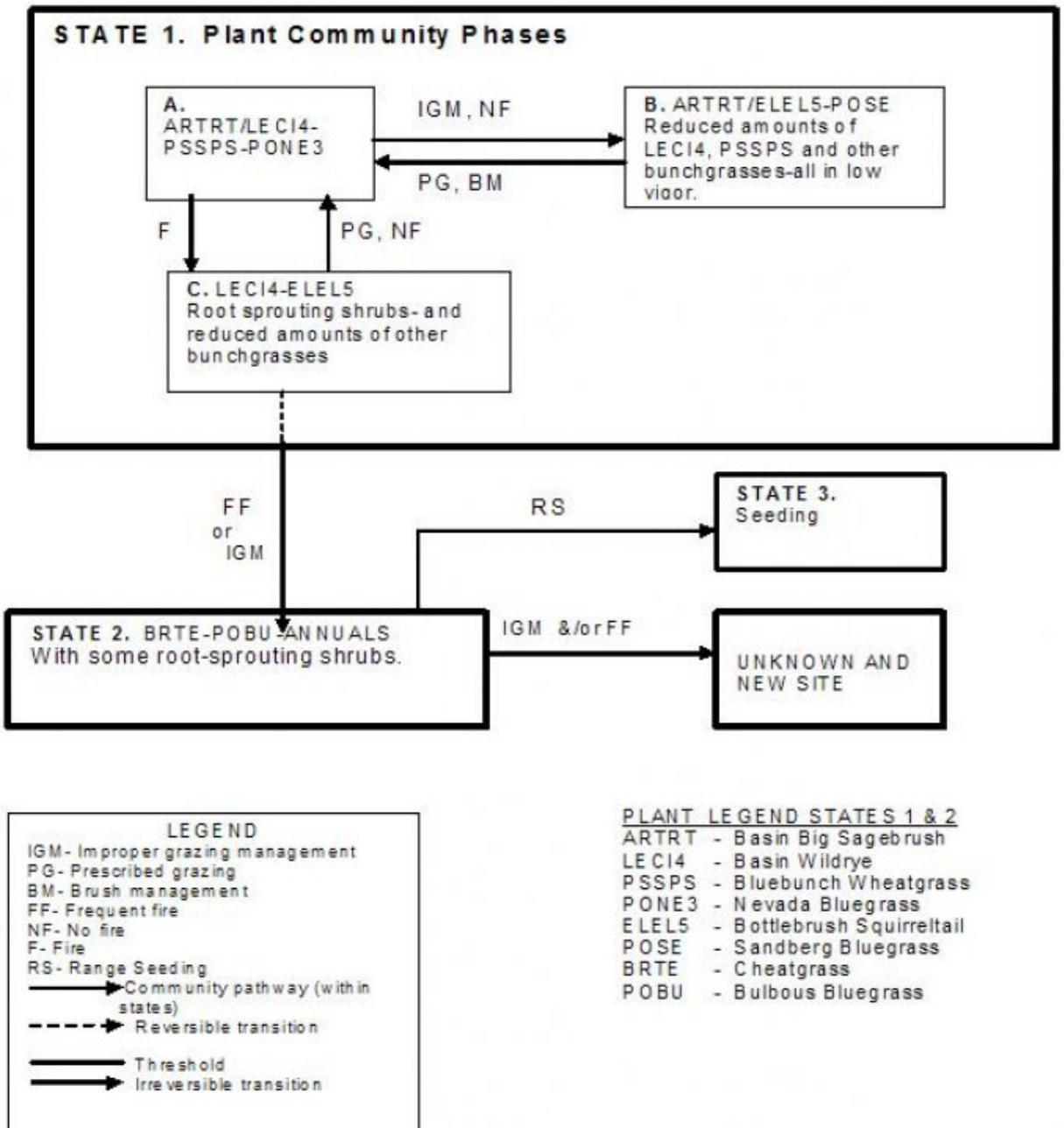
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fire cause this state to cross a threshold and retrogress to a new site with reduced potential. It is not economically practical to return this plant community to State 1 with accelerating practices.

Practice Limitations.

Only slight limitations exist on this site for implementing vegetative management practices. Usually this site is a key area for livestock management due to flatter slopes and non-stony soils. This site is suited to seeding if needed. Mechanical, chemical, and fire are satisfactory methods of brush management on this site. Slight to moderate limitations exist on this site for implementing facilitating practices such as water developments, salting, and fencing.

State and transition model

The Reference State (State 1), the Historic Climax Plant Community (HCPC), moves through many phases depending on the natural and man-made forces that impact the community over time. The Reference Plant Community Phase is Phase A, State 1. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".



State 1
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 has basin big sagebrush with basin wildrye dominating the understory. Nevada bluegrass, bluebunch wheatgrass, arrowleaf balsamroot, tapertip hawksbeard, and lupine are sub-dominant in the understory. Natural fire frequency is 20-50 years.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	420	840	1050
Shrub/Vine	90	180	225
Forb	90	180	225
Total	**600**	**1200**	**1500**

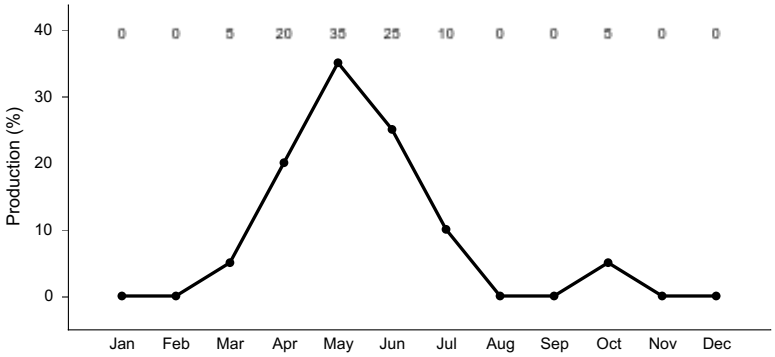


Figure 4. Plant community growth curve (percent production by month). ID1101, D25 ARTRV HCPC. State 1.

State 2
State 1, Plant community B

Community 2.1
State 1, Plant community B

This plant community is dominated by basin big sagebrush with reduced amounts of basin wildrye and bluebunch wheatgrass. Bottlebrush squirreltail and Sandberg bluegrass have increased in the understory. All deep-rooted perennial bunchgrasses are typically in low vigor. Basin big sagebrush has increased as well as some other tall shrubs This state has developed due to improper grazing management and lack of fire. Some cheatgrass, bulbous bluegrass and/or medusahead may have invaded the site.

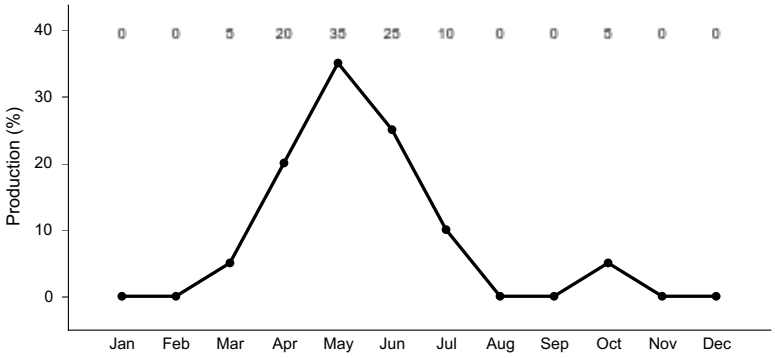


Figure 5. Plant community growth curve (percent production by month). ID1101, D25 ARTRV HCPC. State 1.

State 3
State 1, Plant community C

Community 3.1
State 1, Plant community C

This plant community is dominated by basin wildrye with some gray horsebrush and rabbitbrush. Bottlebrush squirreltail has increased. Forbs remain about in the same proportion as Plant Community A. Basin big sagebrush has been reduced significantly due to wildfire. Some cheatgrass, bulbous bluegrass and/or medusahead may have invaded the site. This plant community is the result of wildfire.

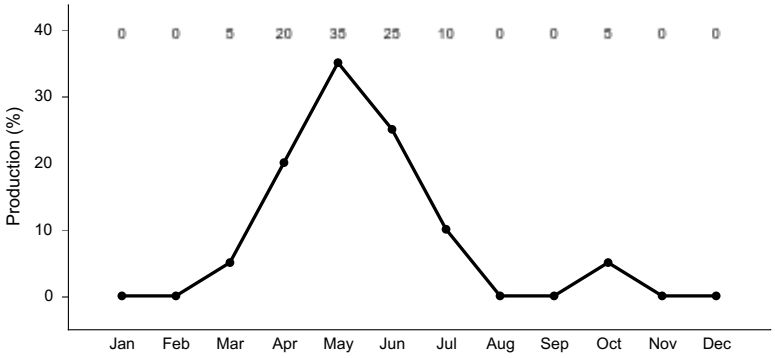


Figure 6. Plant community growth curve (percent production by month). ID1101, D25 ARTRV HCPC. State 1.

State 4
State 2

Community 4.1
State 2

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

State 5
State 3

Community 5.1
State 3

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

State 6
Unknown new site

Community 6.1
Unknown new site

This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This state has developed due to continued improper grazing management and/or frequent fires. It is not economically practical to return this plant community to State 1 with accelerating practices.

Additional community tables

Animal community

Wildlife Interpretations.
Animal Community – Wildlife Interpretations

This rangeland ecological site provides diverse habitat for many native wildlife species. Large herbivore use of this ecological site is dominated by mule deer and pronghorn antelope. Important seasonal habitat is provided for resident and migratory animals including western toad, sagebrush lizard, western rattlesnake, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned

lark, and western meadowlark. Area sensitive species include pygmy rabbit, burrowing owl, great basin ground squirrel, and Townsend pocket gopher. 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 sparrow, sage thrasher, and pygmy rabbits. Encroachment of noxious and invasive plant species (cheatgrass, bulbous bluegrass, and/or medusahead) can replace native plant species which provide critical feed, brood-rearing, and nesting cover for a variety of native wildlife. Water is limited, being provided only by seasonal runoff, artificial water catchments, and spring sites. This rangeland ecological site is commonly 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/ Bluebunch Wheatgrass/ Nevada Blugrass Reference Plant Community (RPC): The RPC provides a diversity of grasses, forbs and shrubs, used by native insect communities who assist in the pollination process for the plant community. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western rattlesnake, western toad, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Spring developments that capture all available water would preclude the use of these sites by amphibians. The plant community supports a variety of migratory and resident avian species that utilize both the grasses and shrubs for food, brood-rearing, and nesting cover. Shrub-steppe obligate avian species of concern include the Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Critical habitat (i.e. lek sites, brood-rearing, winter cover and food) for the sage-grouse is provided by this diverse plant community. The plant community supports seasonal (late spring, summer, and winter) needs of large mammals (mule deer and antelope) providing food and 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 Big Sagebrush/ Bottlebrush Squirreltail/ Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and the absence of fire. An increase in canopy 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 avian obligates 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 plant community supports seasonal needs of large mammals (mule deer and antelope) providing food and cover . A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pygmy rabbits would utilize this plant community.

State 1 Phase 1.3 - Basin Wildrye/ Bottlebrush Squirreltail Plant Community: This plant community is the result of wildfire. The plant community, dominated by herbaceous vegetation with little or no basin big sagebrush provides less vertical structure, limiting use by shrub obligate animals. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators. Reptile use, including short horned lizard, sagebrush lizard, and western rattlesnakes, would be limited or excluded due to the absence of sagebrush. The dominance of herbaceous vegetation with little sagebrush canopy cover would 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 adequate cover of sagebrush is nearby. Use as wintering habitat by sage-grouse would cease. 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 seasonal but the site would offer little thermal cover and young of year cover. Small mammal diversity would be reduced and the plant community would not provide suitable habitat for pygmy rabbits.

State 2 – Cheatgrass/Bulbous Bluegrass and Annual Plant Community: This state has developed due to frequent fires and/or improper grazing management. This plant community would not support a diverse insect community. The reduced forb component in the plant community would support a very limited population of pollinators. Most reptilian species would not be supported with food, water, or cover. The plant community would not support sage-grouse, sage thrasher, Brewer's sparrow, or sage sparrow. Grassland avian species would also avoid these areas. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large mammals may utilize the herbaceous vegetation in the early part of the year when the invasive annuals

(cheatgrass) would be more palatable. At other times of the year large mammals would not regularly utilize these areas due to poor food and cover conditions. The populations of small mammals would be dominated by open grassland species.

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

Grazing Interpretations.

This site is suited for grazing by domestic livestock in the spring, summer, and fall. If water is available, the site is easily grazed by livestock due to gentle slopes.

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. When hydrologic conditions of the vegetative cover are good, natural erosion hazard is slight.

Recreational uses

This site has limited value for recreation.

Wood products

None

Other products

None

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Those involved in developing this site description include:
Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC
Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC
Jim Cornwell, Range Management Specialist, IASCD
Joe May, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD

Other references

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

Contributors

DLF

Approval

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	03/27/2007
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. If rills are present they are likely to occur on slopes over 15 percent and immediately following wildfire. They are most likely to occur on silt loam surface textures.

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2. **Presence of water flow patterns:** Water-Flow Patterns: rarely occur on this site except on slopes greater than 15 percent. If they occur, they are short and disrupted flows. They are disrupted by cool season grasses and tall shrubs and are not extensive.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes: are rare on this site. Where flow patterns and/or rills are present, a few pedestals may be expected.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Gound: data is not available. On sites in mid-seral status bare ground may range from 50-65 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:** Wind-Scoured, Blowouts, and/or Deposition Areas: are usually not present. Immediately following wildfire some soil movement may occur on lighter textured soils. Where sagebrush has repopulated the site after a fire, remnants of past wind scour may be present.

7. **Amount of litter movement (describe size and distance expected to travel):** Litter Movement: fine litter in the interspaces may move up to 2 feet following a significant run-off event. 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):** Soil Surface Resistance to Erosion: values should range from 4 to 6 but needs to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil Surface Loss or Degradation: The surface horizon is typically 3 to 16 inches thick. Structure typically includes weak thin platy and weak fine and moderate fine granular. Soil organic matter (SOM) ranges from 1 to 2 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant Community Composition and Distribution Relative to Infiltration: bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration. Tall shrubs can catch snow in the interspaces.

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.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Functional/ Structural Groups: cool season deep -rooted perennial bunchgrasses > tall shrubs = perennial forbs > shallow rooted grasses.

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant Mortality/ Decadence: basin big sagebrush and basin wildrye will become decadent in the absence of normal fire frequency. 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 5-20 percent to a depth of 0.1 inches. Under mature shrubs litter is

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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 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 65-75 percent of the total production, forbs 10-20 percent and shrubs 10-20 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: includes cheatgrass, Vulpia sp., annual mustards, bulbous bluegrass, and spotted and diffuse knapweeds.

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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.
