USDA Natural Resources
Conservation Service

Ecological site R011XB006ID
Loamy 8-12 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: 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

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

R011XB003ID	**Stony Loam 8-12 PZ ARTRW8/PSSPS**
R011XB009ID	**Shallow Stony 8-12 PZ ARTRW8/PSSPS**
R011XB016ID	**Sand 8-12 PZ ARTRT-PUTR2/HECOC8**
R011XY004ID	**Shallow Loamy 8-12 PZ**
R011XY007ID	**Gravelly 10-12 PZ**
R011XY008ID	**South Slope 10-12 PZ**
R011XY015ID	**Loamy Bottom 8-14 PZ ARTRT/LECI4**

Similar sites

R011XY015ID	**Loamy Bottom 8-14 PZ ARTRT/LECI4**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs in slight depressional areas which receive some run-on moisture from adjacent areas. This site occurs on lava plains with less than 10 percent slopes. Elevations range from 4000 to 5500 feet (1200-1700 meters).

Table 2. Representative physiographic features

Landforms	(1) Lava plain
Flooding frequency	None
Elevation	4,000–5,500 ft
Slope	0–3%
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

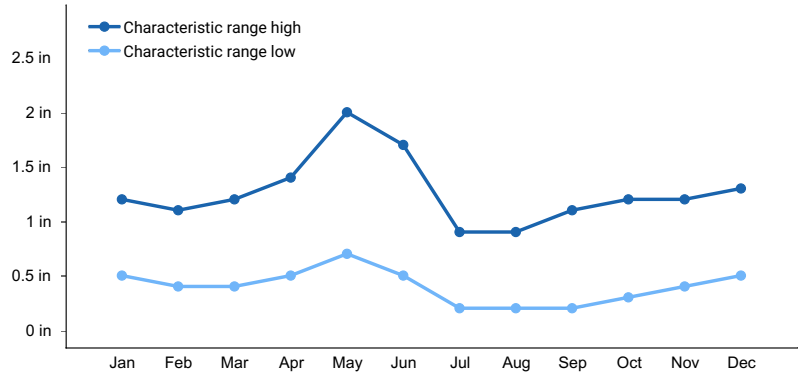


Figure 1. Monthly precipitation range

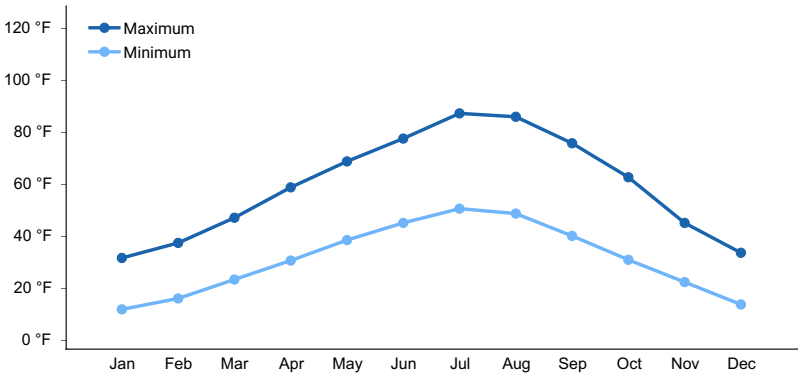


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site is influenced by run-on from adjacent areas.

Soil features

The soils supporting this site are very deep, well drained soils with moderate to moderately slow permeability. Runoff is low. The erosion hazard is slight to high by water, and moderate to high by wind. The available water holding capacity is medium to high. These soils are usually greater than 60 inches deep to bedrock. The soils are generally light colored and may contain a few coarse fragments but not to the extent that will limit production. The surface texture is generally silt loam with few or no surface stones. The subsoil is usually slightly to moderately well developed with clay ranging from approximately 10 to 35 percent. These soils are characterized by an aridic soil moisture regime and a mesic or frigid soil temperature regime.

Soil Series Correlated to this Ecological Site

Menan
McClenden

Table 4. Representative soil features

Surface texture	(1) Sandy loam
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	60 in
Surface fragment cover <=3"	0–3%
Surface fragment cover >3"	0–1%

Available water capacity (0-40in)	5–8 in
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

The dominant visual aspect of this site is basin wildrye and basin big sagebrush. Composition by weight is approximately 60 to 70 percent grass, 10 to 20 percent forbs, and 15 to 25 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 mule deer, lagomorphs, and small rodents.

Fire has historically occurred on the site at intervals of 20-40 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 basin wildrye and basin big sagebrush. Subdominant species include bluebunch wheatgrass, needle and thread, Thurber’s needlegrass, arrowleaf balsamroot, lupine, and milkvetch. Threetip sagebrush may be present. There is a large variety of other grasses, forbs and shrubs that can occur in minor amounts. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

Total annual production is 850 pounds per acre (952 kilograms per hectare) in a normal year. Production in a favorable year is 1300 pounds per acre (1456 kilograms per hectare). Production in an unfavorable year is 500 pounds per acre (560 kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are very dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted perennial bunchgrasses are subdominant.

FUNCTION:

This site is suited for livestock grazing in the spring, early summer, and fall. The distance to water may be a problem in some areas.

The site provides winter and spring range for mule deer. It is also used by small animals, upland birds and songbirds. It has some value as sage grouse brood rearing.

The site has limited value for recreation but does provide some hunting, hiking, and photography opportunities.

Due to gentle slopes and relatively low production, this site can be degraded from improper livestock management. A mixed stand of shrubs and perennial grasses is necessary to reach the potential of the site.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, basin big sagebrush can gradually increase on the site. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, basin big sagebrush can displace most of the primary understory species and basin wildrye can become decadent.

When fires become more frequent than historic levels (20-40 years), basin big sagebrush is reduced significantly. Rabbitbrush and gray horsebrush can increase slightly. If threetip sagebrush is present, it may increase also in the plant community. With continued short fire frequency, basin big sagebrush can be completely eliminated along with many of the desirable understory species such as basin wildrye, bluebunch wheatgrass, and Indian ricegrass. These species may be replaced by thickspike wheatgrass along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass will invade the site. These fine fuels will increase the fire frequency.

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. Continuous early spring grazing can be detrimental to basin wildrye. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to increase in basin big sagebrush and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels. As cheatgrass increases 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. Brush management should be carefully planned, as a reduction in shrubs without a suitable understory of perennial grasses can increase cheatgrass which will 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 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. 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.
Annual and perennial invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

Mule deer use this site primarily in the spring and winters. Their numbers are seldom high enough to adversely affect the plant community. Burrowing rodents can impact the community providing microsites for invasion of undesirable species.

Watershed:

Decreased infiltration and increased runoff occur with an increase in basin big sagebrush. Desired understory

species can be reduced. This composition change can affect nutrient and water cycles. Increased runoff also causes sheet and rill erosion. 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. See the “Hydrology” section for more detail.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.
Phase A to B. Develops with improper grazing management.
Phase A to C. Develops with fire.
Phase B to A. Develops with prescribed grazing.
Phase C to A. Develops with prescribed grazing and no fire.

State 1 Phase C to State 2. Develops through frequent fire and/or continued improper grazing management. The site has crossed a threshold. It is generally not economically feasible to move this state back to State 1 with accelerated practices.

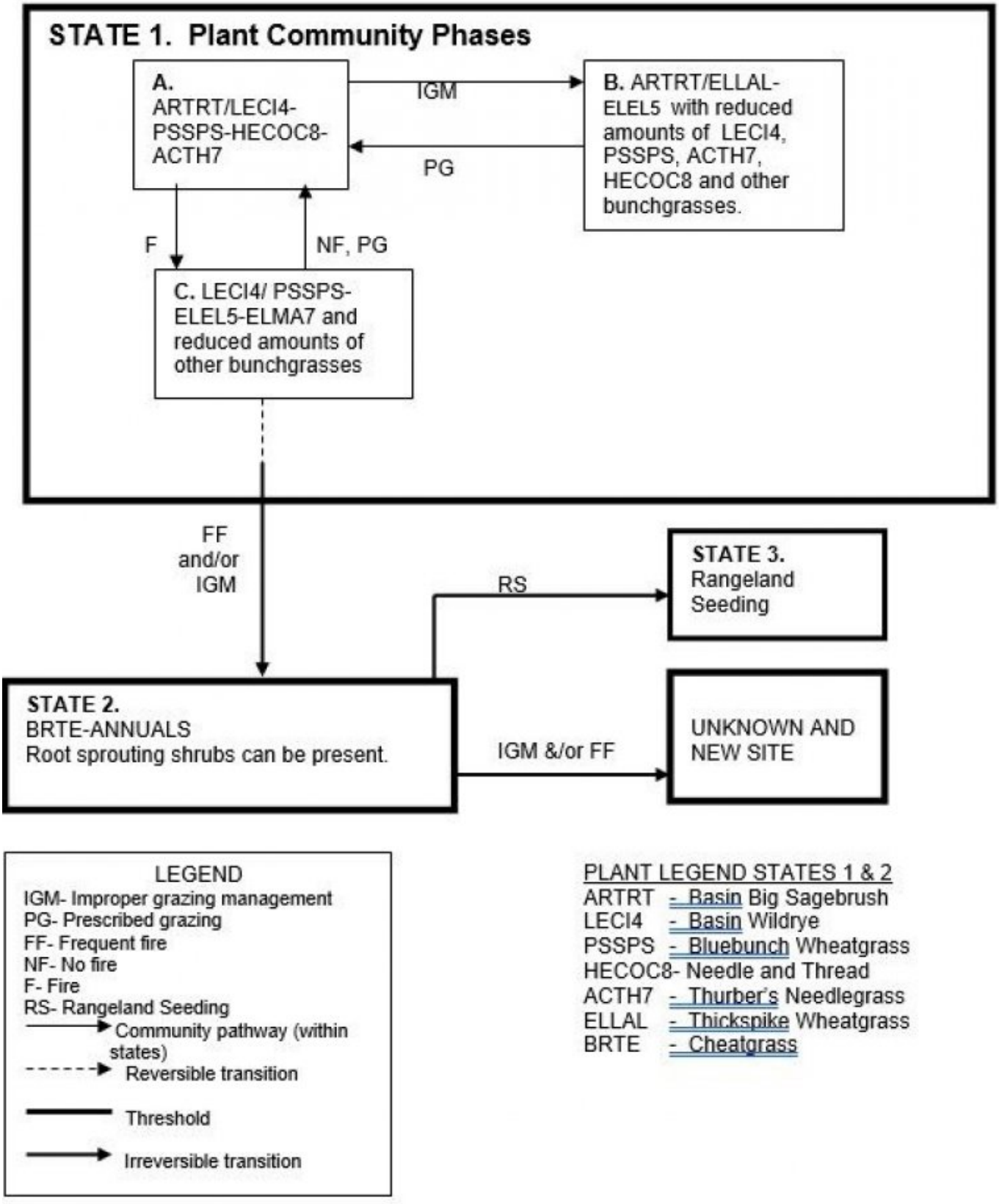
State 2 to State 3. Develops with range seeding.

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 generally not economically feasible to move this state back to State 1 with accelerated practices.

Practice Limitations:

Few limitations exist for implementing vegetation management, accelerated and facilitating practices on this site. Adequate vegetation cover must be maintained to prevent wind erosion on some soils. Low average annual precipitation and light textured soils in some areas make necessary certain precautions be followed in seeding, brush management, prescribed burning and some mechanical means of treating the soil to protect the soil from blowing.

State and transition model



State 1
State 1 Phase A

Community 1.1
State 1 Phase A

This plant community is dominated by basin wildrye and basin big sagebrush. Subdominant species include bluebunch wheatgrass, needle and thread, Thurber's needlegrass, arrowleaf balsamroot, lupine, and milkvetch. Threetip sagebrush may be present. There is a large variety of other grasses, forbs, and shrubs that can occur in

minor amounts. Natural fire frequency is 20-40 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	20-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

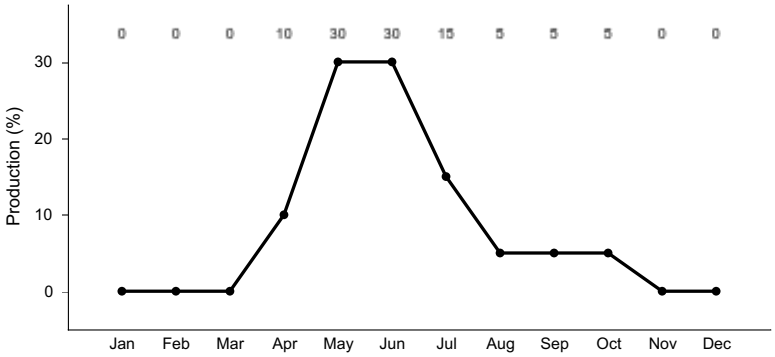


Figure 3. Plant community growth curve (percent production by month). ID0613, ARTRT/ LECI4. State 1.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

This plant community is dominated by basin big sagebrush with reduced amounts of basin wildrye. Thickspike wheatgrass and bottlebrush squirreltail have increased in the understory. There is a reduced amount of bluebunch wheatgrass, Thurber’s needlegrass, needle and thread grass, and other perennial grasses. All deep-rooted bunchgrasses are typically in low vigor. Basin big sagebrush has increased. This state has developed due to improper grazing management. Some cheatgrass may have invaded the site.

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	20-35%

Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

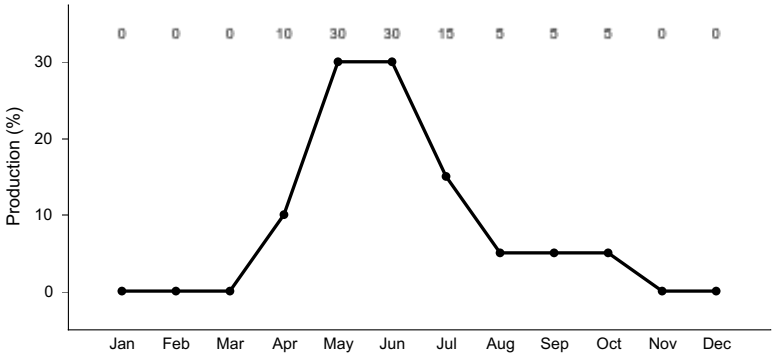


Figure 4. Plant community growth curve (percent production by month). ID0613, ARTRT/ LECI4. State 1.

State 3
State 1 Phase C

Community 3.1
State 1 Phase C

This plant community is dominated by basin wildrye and bluebunch wheatgrass. Some Thurber's needlegrass may be lost due to fire. Bottlebrush squirreltail and thickspike wheatgrass have increased. Forbs remain about in the same proportion as Phase A. Very little basin big sagebrush is present due to wildfire, but some rabbitbrush and horsebrush are present due to sprouting. Threetip sagebrush is ecotypically a weak or strong sprouter. If the plants are strong sprouters, there may be an increase of this species. If it is weak sprouter, it may be killed out. Some cheatgrass has invaded the site. This plant community is the 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	20-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

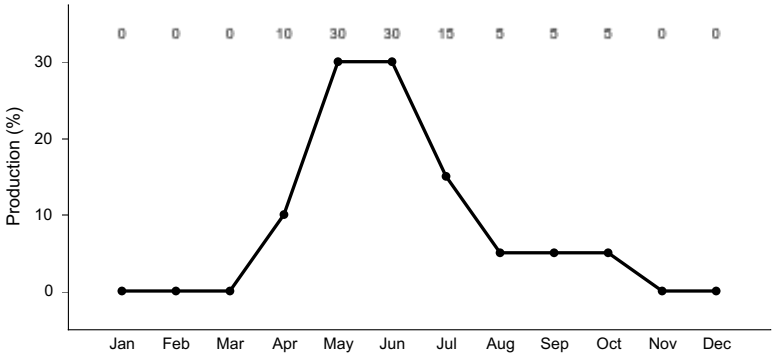


Figure 5. Plant community growth curve (percent production by month). ID0613, ARTRT/ LECI4. State 1.

State 4
State 2

Community 4.1
State 2

This plant community is dominated by cheatgrass and other annuals. Root sprouting shrubs such as rabbitbrush and horsebrush can be present, dependent upon, how frequent, fire has occurred. Some soil loss has occurred. This state has developed due to frequent fires and/or improper grazing management. The site has crossed a threshold. It is generally not economically feasible to move this state back to State 1 with accelerated practices.

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	20-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

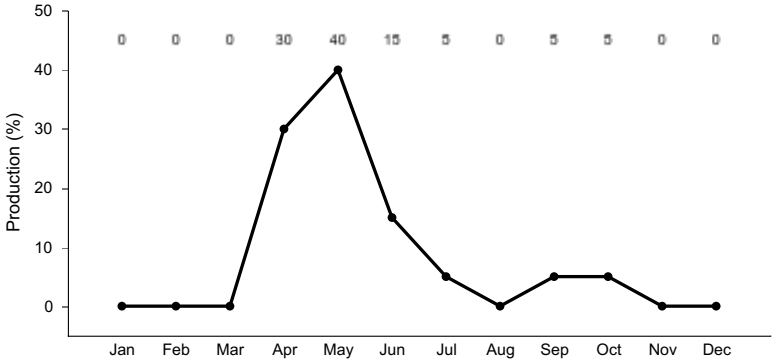


Figure 6. Plant community growth curve (percent production by month). ID0609, ARTRT/ ARTRW8 POSE/ ANNUALS. State 2.

State 5
State 3

Community 5.1
State 3

Rangeland seeding. This plant community may be introduced species or a mixture of native species that mimic the Reference State.

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	20-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

State 6
State 4

Community 6.1
State 4

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.

Table 10. 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	20-35%
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 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/ Needle and Thread/ Thurber's Needlegrass 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 sage-grouse is provided by this diverse plant community. The plant community supports seasonal (late spring, summer, and winter) needs for mule deer providing food and cover. Antelope may utilize the site in the winter for food and thermal 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/ Thickspike Wheatgrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of improper grazing management. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. The reduced herbaceous understory results in a reduced diversity of insects. You can expect a decrease in populations and diversity of reptiles due to the reduced diversity and canopy cover of herbaceous vegetation. Shrub-steppe obligate avian species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Critical habitat (lek sites, brood-rearing, winter cover and food) for sage-grouse is limited due to the reduced diversity and canopy cover of herbaceous vegetation. The plant community provides escape and thermal cover for mule deer and antelope. The loss of understory will result in a shorter forage season for large mammals. 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/ Bluebunch Wheatgrass/ 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 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 be lost. The dominance of herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer and antelope) use for food would be seasonal but the site would offer little thermal 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 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, birds, or mammals. Sagebrush obligate animal species would not be supported with a monoculture of grass species. Grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat, 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 suitable for livestock grazing in late spring, summer, and fall. Early spring grazing can be detrimental to basin wildrye. Water is often limited in the summer and fall.
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

The soils in this site are in hydrologic group B. When hydrologic conditions of the vegetative cover is good, natural erosion hazard is slight.

Recreational uses

The site has limited value for recreation but does provide some hunting, hiking and photography opportunities.

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

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.

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	04/01/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rarely occurs on this site.

2. **Presence of water flow patterns:** rarely occurs on this site.

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):** no data on bare ground but is expected to range from 30-40 percent.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** blowouts and depositional areas are usually not present. Some light textured soils can blow following a fire and mounded soil deposition may be found in the crowns of bunchgrass plants.

7. **Amount of litter movement (describe size and distance expected to travel):** 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):** 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, weak fine and moderate fine granular, and weak fine to medium subangular blocky. Soil organic matter (SOM) ranges from 1 to 2 percent. The surface horizon is typically 4 to 15 inches thick.

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 provide a favorable micro-site for vegetative establishment which further increases infiltration.

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: tall shrubs

    Other: perennial forbs

    Additional: shallow rooted grasses

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** basin big sagebrush and basin wildrye will become decadent in the absence of fire and ungulate grazing. Grass and forb mortality will occur as tall shrubs increase.

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14. **Average percent litter cover (%) and depth (in):** annual litter cover in the interspaces will be 5-10 percent to a depth of <0.1". Under the mature shrubs litter is greater than 0.5 inches. Fine litter can accumulate on the terracettes.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 850 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 60-70 percent of the total, forbs 10-20 percent, and shrubs 15-25 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, clasping pepperweed, beggars ticks, tansymustard, Jim Hill tumblemustard, yellow salsify, burr buttercup, medusahead, Russian thistle, annual kochia, and halogeton.

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