

Ecological site R012XY010ID North Slope Loamy 12-16 PZ ARTR4/FEID

Last updated: 9/21/2020
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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): 012X—Lost River Valleys and Mountains

Land Resource Region: B (Northwestern Wheat and Range)
MLRA: 12 (Lost River Valleys and Mountains)

EPA EcoRegion: Level III (Middle Rockies)

LRU notes

012X-Lost River Valleys and Mountains

Precipitation or Climate Zone: 12-16" P.Z.
<https://soils.usda.gov/survey/geography/mlra/index.html>

Classification relationships

Artemisia tripartite/ Festuca idahoensis HT in "Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35".

Ecological site concept

Site does not receive additional water.

Soils are:

Not saline or saline-sodic.

Deep to very deep. >35% (by volume) coarse fragments, mostly cobbles and stones, skeletal within 20" of soil surface.

Not strongly or violently effervescent in the to 20" of the soil profile.

textures usually range from loam to clay loam in 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

R012XY008ID	Gravelly 13-16 PZ ARTR4/PSSPS-FEID
R012XY012ID	Loamy 12-16 PZ ARTRV/FEID-PSSPS
R012XY015ID	Steep Limestone 12-20 PZ CELE3/PSSPS-FEID
R012XY020ID	Clayey 13-16 PZ ARAR8/FEID

R012XY029ID	Clayey South Slope 12-16 PZ ARAR8/PSSPS
R012XY034ID	Clayey 12-16 PZ ARARL/FEID
R012XY048ID	North Slope Deep Loamy 12-16 PZ ARTRV/FEID

Similar sites

R012XY048ID	North Slope Deep Loamy 12-16 PZ ARTRV/FEID
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tripartita</i>
Herbaceous	(1) <i>Festuca idahoensis</i>

Physiographic features

This site occurs on mountain side slopes and ridges which are exposed to winds. Slopes range from 20 to 70 percent. They are usually greater than 30 percent. The aspect is north. The elevation ranges from 5300 to 9000 feet (1615-2743 meters).

Table 2. Representative physiographic features

Landforms	(1) Mountain slope (2) Ridge
Elevation	1,615–2,743 m
Slope	20–70%
Aspect	N, E

Climatic features

MLRA 12 is dominated by dramatic changes in elevation which, in turn, influence local weather patterns. The intermontane valleys have elevations as low as 3800 feet, while the adjacent mountains may reach more than 12,600 feet. The average annual precipitation for the entire MLRA, based on 10 long term climate stations located throughout the MLRA, is approximately 9.38 inches. However, the dry valleys may have averages as low as 6 inches, while the upper peaks may have averages that exceed 46 inches per year.

Temperatures vary considerably over the year. The average annual temperature is 42.25 degrees F. The average low is 27.4 degrees while the average high temperature is 57 degrees.

In the summer the sun shines 78% of the time, but drops to 40% in the winter. The prevailing wind is location-dependent, and generally flows parallel to the orientation of the dominant valleys. In the summer localized afternoon upslope winds and evening downslope winds are common. The average windspeed is greatest in the spring and early summer.

The frost free period ranges from 102 to 107 days while the freeze free period ranges from 134 to 139 days across the MLRA.

Table 3. Representative climatic features

Frost-free period (average)	107 days
Freeze-free period (average)	139 days
Precipitation total (average)	279 mm

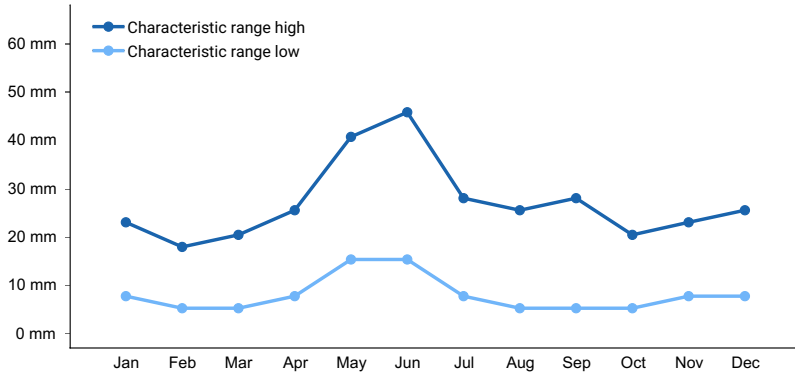


Figure 1. Monthly precipitation range

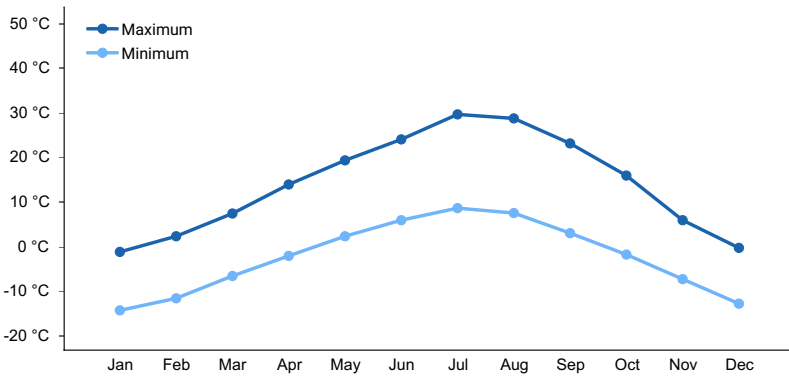


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils on this site are gravelly, cobbly or stony loams, silt loams and clay loams generally very deep. The exception is Nielsen which is shallow to fractured bedrock and roots trellis into the fractures. Coarse fragments may be present in the soil profile. The soils are well to somewhat excessively drain with no to moderately rapid permeability. Available water capacity is very low to moderate. Erosion hazard is severe due to the steep slopes and when the vegetation cover is depleted. The soils have an aridic soil moisture regime or an aridic bordering on xeric. The soil temperature regime ranges from frigid to cryic.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Cobbly silt loam (3) Stony clay loam
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	25–152 cm
Surface fragment cover ≤3"	0–35%
Surface fragment cover >3"	0–20%
Available water capacity (0-101.6cm)	3.3–18.8 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%

Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–7.8
Subsurface fragment volume <=3" (Depth not specified)	24–65%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

The dominant visual aspect of this site is Idaho fescue and threetip sagebrush. Composition by weight is approximately 50 to 70 percent grasses, 10 to 20 percent forbs and 20 to 30 percent shrubs.

NOTE: This site may be R012XYO48ID, NORTH SLOPE DEEP LOAMY 12-16" ARTRV/FEID that has burned more frequently than the historic intervals sometime in the past. This may have created a fire disclimax with threetip sagebrush becoming the dominant shrub. This theory needs to be field tested.

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 mule deer, Rocky Mountain elk, pronghorn antelope, big horn sheep and lagomorphs. Fire has historically occurred on the site at intervals of 50 to 70 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 threetip sagebrush and Idaho fescue. Mountain big sagebrush is a subdominant shrub species and a variety of other shrubs can occur. Subdominant herbaceous species include bluebunch wheatgrass, milkvetch and arrowleaf balsamroot. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 600 pounds per acre (670 kilograms per hectare) in a normal year. Production in a favorable year is 900 pounds per acre (1008 kilograms per hectare). Production in an unfavorable year is 450 pounds per acre (504 kilograms per hectare). Structurally, cool season deep-rooted perennial bunchgrasses are dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted perennial bunchgrasses are subdominant.

FUNCTION:

This site is best suited for summer and fall grazing by livestock. This site is valuable as habitat for mule deer, Rocky Mountain elk, big horn sheep, pronghorn antelope and raptors. It is used by wildlife in the summer and fall. It is also suited for recreationAL use in the summer and fall. It is used for hunting, hiking and photography.

Due to the limited access on steeper slopes and relatively high production, most areas of this site are not easily degraded. Lower footslopes in proximity to bottoms or drainages are most likely to degrade due to access by animals from these adjoining lands. Infiltration is good where the plant community has a good shrub component. 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:

Three-tip sagebrush exhibits variable sprouting abilities following fire. The specific response may depend on ecotypic differences, fire severity, soil moisture or a combination of these factors. Generally, it re-sprouts vigorously after fire, but may be a weak sprouter in some areas. It is considered a strong sprouter for this site. Three-tip sagebrush sprouts from shallow lateral roots or the root crown. It can also layer. Nearly pure stands can develop

after the site burns.

In the absence of normal fire frequency, three-tip sagebrush can gradually increase on the site. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, these shrubs can displace many of the primary understory species. If a Utah juniper seed source is in the proximity, juniper can invade the site. See "Influence of Juniper Invasion" below. An increase in tall shrubs generally leads to an increase in juniper by providing bird perches and "nursery" sites for juniper establishment.

When fires occur more frequently than historic levels (50-70 years), three-tip sagebrush is reduced significantly. Rabbitbrush can increase slightly. Three-tip sagebrush may re-sprout vigorously after burning. With a continued short fire frequency, three-tip sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass and Idaho fescue. These species may be replaced by Sandberg bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass can invade the site at lower elevations. 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 Idaho fescue and bluebunch wheatgrass and other bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to increase in three-tip sagebrush, annuals and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing these fine fuels. The site then becomes susceptible to an invasion of noxious and invasive plants and soil erosion. If cheatgrass and/or medusahead increase due to improper grazing management and become co-dominant with Sandberg bluegrass and 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 three-tip 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 increase cheatgrass and/or medusahead which leads 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 changes in fire frequency.

Influence of insects and disease:

Outbreaks can affect vegetation health. Mormon crickets 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. Perennial and annual invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

Big game animals use this site in the spring, summer and fall. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff occur with an increase in three-tip 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.

Influence of juniper invasion:

The following discussion deals with Utah juniper.

In plant communities that are invaded by juniper, the species has a competitive advantage for the following reasons:

- Juniper is very drought tolerant.
- It has the ability to extract soil moisture from a wide range of soil depths.
- Juniper has high evapo-transpiration rates.
- The species intercepts rain and snow before it reaches the soil surface.
- It has the ability to grow as long as there is soil moisture and the temperature is above freezing.
- Juniper has a relatively rapid growth rate and is long-lived. It can readily over-top shade intolerant species which leads to mortality.
- Nutrient cycling is reduced.
- As the canopy closes, juniper gains control of energy capture.

As juniper extracts water, other plants are unable to acquire sufficient water and nutrients to sustain growth and reproduction, thus reducing cover and biomass in the interspaces. After the canopy closes, there is sufficient soil moisture available for shallow-rooted, shade tolerant species to persist directly under the tree.

The following hydrological impacts occur on sites invaded by juniper:

- Infiltration in the interspaces is reduced.
- Run-off increases resulting in increased sheet and rill erosion with elevated sediment loads.
- Soil temperatures increase in the interspaces which results in accelerated drying of the soil surface.
- Increased bare ground in the interspaces.
- Soil moisture storage is reduced.

As bare ground and interconnectiveness of bare ground increases, flow rates are accelerated (reduction of flow sinuosity) and run-off out of the area increases.

Degradation of these systems can result in the formation of a feedback cycle in which greater juniper cover and density results in greater plant and soil disturbance between the canopies.

In summary, a closed juniper community takes control of the following ecological processes: (1) hydrology, (2) energy capture and (3) nutrient cycling. The changes are primarily driven by the hydrological processes. The development of a closed juniper canopy always results in a transition across the threshold to a different state. Generally, when juniper canopy cover nears 20%, the plant community is approaching the threshold.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.

Phase A to B. Develops in the absence of fire and improper grazing management. There is a Utah juniper seed source present in the vicinity near the site.

Phase A to C. Results from a fire.

Phase A to D. Results from improper grazing management and no fire. There is no Utah juniper seed source present in the vicinity.

Phase B to C. Results from a wildfire or brush management.

Phase B to A. Occurs with prescribed grazing and brush management or prescribed burning.

Phase C to A. Results from prescribed grazing and no fire.

Phase D to A. Occurs with prescribed grazing.

Phase D to C. Occurs with fire or prescribed burning and prescribed grazing.

Phase C to D. Occurs with no fire and improper grazing management.

State 1 Phase C and D to State 2. Develops through frequent fire and improper grazing

management. This site has crossed the threshold. It is economically practical to return this plant community to State 1 with accelerating practices.

State 1, Phase B to State 3. Develops with improper grazing management and no fire from a juniper invaded phase of State 1. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

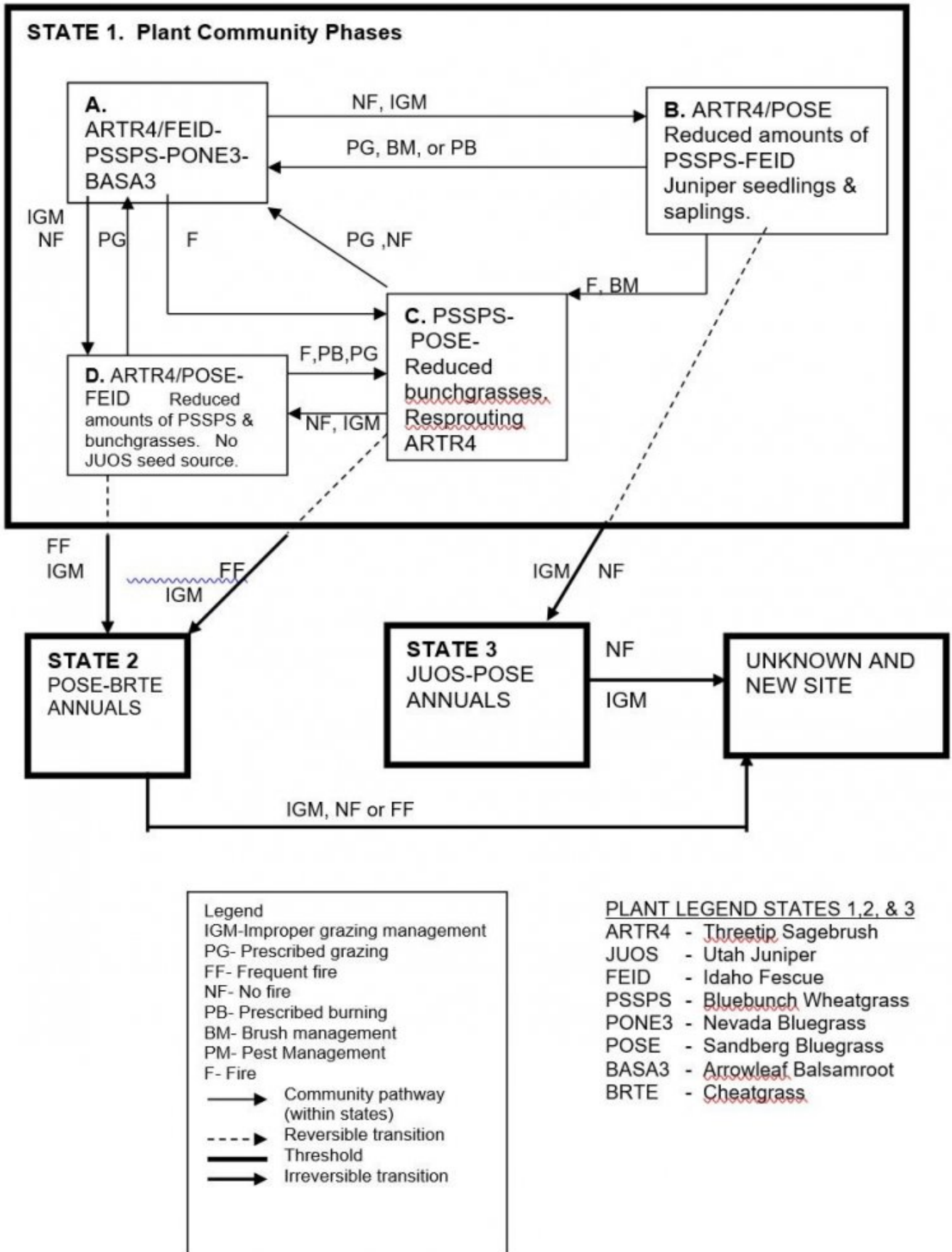
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and no fire or frequent fire cause this state to cross the threshold and retrogress to a new site with reduced potential. It is economically impractical to return this plant community to State 1 with accelerating practices.

State 3 to unknown site. Continued lack of fire or improper grazing management cause this state to cross the threshold and retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology. It is economically impractical to return this plant community to State 1 with accelerating practices.

Practice Limitations:

Moderate limitations exist for vegetative management practices due to slope. Severe limitations exist on the site for implementing facilitating and accelerating practices due to steep slopes.

State and transition model



State 1
 State 1, Phase A, Reference Plant Community Phase

Community 1.1
 State 1, Phase A, Reference Plant Community Phase

This plant community is dominated by threetip sagebrush and Idaho fescue. Mountain big sagebrush is a subdominant shrub species and a variety of other shrubs can occur. Subdominant herbaceous species include bluebunch wheatgrass, Nevada bluegrass, milkvetch and arrowleaf balsamroot. Natural fire frequency is 50-70 years.

State 2
State1, Phase B

Community 2.1
State1, Phase B

This plant community is dominated by threetip sagebrush with some Utah juniper seedlings and saplings invading. Sandberg bluegrass has increased. Bluebunch wheatgrass and Idaho fescue are still significant in the plant community but with reduced amounts and in low vigor. A wide variety of other grasses, forbs and shrubs still may occur but in very small amounts and may be in low vigor. A Utah juniper seed source is present in nearby sites. Some annuals have invaded the community. This state has developed due to fire frequency being much longer than normal and improper grazing management.

State 3
State 1, Phase C

Community 3.1
State 1, Phase C

This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass. Idaho fescue can be lost or its vigor severely reduced due to fire. Forbs remain about in the same proportion as Phase A. Three-tip sagebrush has been reduced significantly due to wildfire but will likely re-sprout. Some cheatgrass may have invaded the site at lower elevations. This plant community is the result of wildfire.

State 4
State 1, Phase D

Community 4.1
State 1, Phase D

This plant community is dominated by three-tip sagebrush with reduced amounts of Idaho fescue and other deep-rooted perennial bunchgrasses. Sandberg bluegrass has increased in the understory. All deep-rooted perennial bunchgrasses are typically in low vigor. Three-tip 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 may have invaded the site at lower elevations.

State 5
State 2

Community 5.1
State 2

This plant community is dominated by Sandberg bluegrass, cheatgrass and other annuals. Root sprouting shrubs such as three-tip sagebrush, rabbitbrush can be present, dependent upon how frequent fire has occurred. Some soil loss has occurred. This state has developed due to frequent fires and improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

State 6
State 3

Community 6.1

State 3

This plant community is dominated by Utah juniper with Sandberg bluegrass and annuals in the understory. There are few shrubs present due to competition from junipers. Some deep-rooted perennials may be present under the junipers. Generally, shrub cover is below 10-15%, bare ground is above 25-30% and juniper cover is greater than 20%. Some soil loss has occurred. This plant community has developed due to continued improper grazing management and lack of fire. This site has crossed the threshold. It is economically impractical to return this community to State 1 with accelerated practices.

State 7

Unknown new site

Community 7.1

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, no fire or frequent fires from State 2 and no fire and improper grazing management from State 3. It is economically impractical to return this community to State 1 with accelerated 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 pronghorn antelope, and elk. Important seasonal habitat is provided for resident and migratory animals including western toad, sagebrush lizard, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Changes in the plant community composition can reduce the number and diversity of wildlife species in the area. With reduced shrub cover, shrub-steppe obligate bird species become rare including sage-grouse, brewer's sparrow, sage sparrow, and sage thrasher. Encroachment of noxious and invasive plant species (cheatgrass and 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.

State 1 Phase 1.1 - Three-tip Sagebrush/ Bluebunch Wheatgrass/ Idaho Fescue/ Sandberg Bluegrass/ Arrowleaf Balsamroot Reference Plant Community (RPC): This plant community provides a diversity of grasses, forbs, and shrubs used 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. Spring developments that capture all available water would preclude the use of these sites by amphibians. Area sensitive species reliant on the native shrub-steppe plant community include the Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Habitat (nesting areas, brood-rearing, winter cover and food) for sage-grouse is provided by this diverse plant community. The plant community supports spring and fall forage and cover habitat for large mammals (mule deer, elk, and pronghorn). The dominant shrub, three-tip sagebrush, provides limited forage value for large mammals. A diverse small mammal population including golden-mantled ground squirrels, Great Basin ground squirrel, Idaho pocket gopher, and Merriam's shrew may utilize these areas. Pika may be present at higher elevations when adjacent to open talus slopes.

State 1 Phase 1.2 - Three-tip Sagebrush / Sandberg Bluegrass/ Utah Juniper Plant Community: This phase has developed due to extended fire return interval that are much longer than normal, and improper grazing management. An increase in canopy cover of sagebrush and juniper contributes to a sparse herbaceous understory. A reduced herbaceous understory results in lower diversity and numbers of insects. The reptile

community will be similar to State 1 Phase 1.1, represented by leopard lizard, short horned lizard, sagebrush lizard, and western skink. The reduced diversity of insects and understory cover may reduce the quality of food and cover for reptile populations. As juniper increases, habitat for Brewer's sparrow, sage thrasher, and sage sparrow may increase. Remaining sagebrush provides brood-rearing, winter cover, and winter food for sage-grouse, but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community supports limited forage habitat during spring and fall for mule deer, elk, and pronghorn. As juniper encroachment occurs, the site will provide additional thermal cover and young of year cover for large mammals. A small mammal population including golden-mantled ground squirrels, jackrabbits, deer mice, and Great Basin kangaroo rats may utilize this site.

State 1 Phase 1.3 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure for animals. Large areas of Phase 1.3 would fragment the reference plant community and would reduce the quality of the habitat for shrub-steppe obligate animal species. Insect diversity would be reduced, but a native forb plant community similar to Phase 1.1 would still support select pollinators. The reptiles including short horned lizard and sagebrush lizard would be limited or excluded. As three-tip sagebrush re-establishes, vertical structure for these reptiles will return. 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 limited brood-rearing habitat for sage-grouse when sagebrush habitat is nearby. The plant community would not provide suitable winter cover or winter food for sage-grouse. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark, vesper sparrow, savannah sparrow, and western meadowlark). Large mammal (mule deer, pronghorn, and elk) use would be seasonal but the site would offer little thermal or young of year cover.

State 1 Phase 1.4 - Three-tip Sagebrush/ Sandberg Bluegrass/ Idaho Fescue 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. Grasses, forbs, and shrubs are used by native insects that assist in pollination but the reduced herbaceous understory results in lower diversity of insects. The reptile community is represented by leopard lizard, short horned lizard, sagebrush lizard, and western skink. The reduced diversity of insects may reduce reptile diversity and populations. Reduced herbaceous understory limits the use of this plant community by avian species. Shrub-steppe obligate bird species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Quality of brood-rearing habitat and nesting cover for sage-grouse is reduced due to low herbaceous canopy cover. The reduced vigor of understory vegetation makes for a shorter forage season for mule deer. The dominant shrub, three-tip sagebrush, provides limited forage value for large mammals. Young of year cover would be provided for deer and pronghorn. A small mammal population including golden-mantled ground squirrels, jackrabbits, and deer mice would utilize this plant community.

State 2 - Sandberg Bluegrass/ Cheatgrass and Annual Plant Community: This plant community is the result of improper grazing management and frequent fire. Large areas of State 2 would fragment the reference plant community and would reduce the quality of habitat for shrub-steppe obligate animal species. The plant community does not support a diverse insect community. The reduced forb component in the plant community would support a very limited population of pollinators. Most native reptilian species would not be supported by this plant community due to the loss of sagebrush. As three-tip sagebrush re-establishes, vertical structure for these reptiles will return. The plant community does not support the habitat requirements for sage-grouse, sage thrasher, Brewer's sparrow, or sage sparrow. Diversity of grassland avian species is reduced due to poor cover and 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 diversity and populations of small mammals may change due to poor food, cover, and more successful hunting by predators.

State 3 - Utah Juniper/ Sandberg Bluegrass/ Annuals Plant Community: This plant community has developed due to continued improper grazing management and a lack of fire. An increase in canopy cover of junipers contributes to a sparse shrub (sagebrush) layer and limited herbaceous understory. A reduced herbaceous understory results in lower diversity and numbers of insects. The reptile community will be represented by leopard lizard, short horned lizard, sagebrush lizard, and western skink, but the reduced diversity of insects and understory cover reduces the quality of the habitat for reptile populations. Birds using this site as resident or migratory habitat include Juniper titmouse, western bluebird, and Virginia's warbler. The Juniper titmouse relies heavily on juniper seeds for winter

food. As juniper increases and sagebrush decreases, the quality of habitat for Brewer's sparrow, sage thrasher, and sage sparrow will decrease. Habitat for sage-grouse will not be provided by this plant community. The plant community supports limited forage habitat during spring and fall for mule deer, elk, and pronghorn. As juniper encroachment occurs, the site will provide additional thermal and young of year cover for large mammals. Quality of habitat will decline for small mammal populations including golden-mantled ground squirrels, jackrabbits, deer mice, and Great Basin kangaroo rats.

Grazing Interpretations.

This site is best suited to summer and fall grazing. The steep slopes will limit livestock movement especially cattle. 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 groups B and C. When ground cover is at or near potential, the erosion is moderately low to moderately high.

Recreational uses

This site is used for hunting, hiking and photography.

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:

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Other references

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Approval

Kendra Moseley, 9/21/2020

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
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Date	02/01/2008
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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Rills can occur on this site. If rills are present, they are likely to occur immediately following wildfire. Rills are most likely to occur on soils with surface textures of silt loam and clay loam. They are not extensive.

- 2. Presence of water flow patterns:** Water-flow patterns occur on the site. They occur as short and disrupted flows. They are disrupted by cool season grasses and tall shrubs and are not extensive.

- 3. Number and height of erosional pedestals or terracettes:** Erosional pedestals or terracettes are rare on this site. Where flow patterns and/or rills are present, few pedestals may be expected. Terracettes can occur as deposits behind large bunchgrasses and shrubs. They are not extensive.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Data is not available. On sites in mid-seral status, bare ground may range from 25-35 percent.

5. **Number of gullies and erosion associated with gullies:** None.

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

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move up to 3 feet 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 3 to 5 but need to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A or A1 horizon is typically 2 to 8 inches thick. Structure ranges from weak and moderate very fine and fine granular to weak very thin and thin platy to weak very fine, fine and medium subangular blocky. Soil organic matter (SOM) ranges from 1 to 5 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses, especially deep-rooted, slow run-off and increase infiltration. Tall shrubs accumulate 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 is 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: Cool season deep-rooted perennial bunchgrasses

Sub-dominant: > tall shrubs > perennial forbs > shallow rooted bunchgrasses

Other:

Additional:

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

14. **Average percent litter cover (%) and depth (in):** Additional litter cover data is needed but is expected to be 20-30 percent to a depth of 0.1 inches. Under mature shrubs, litter is >0.5 inches deep and is 90-100 percent ground cover.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production is 600 pounds per acre (670 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 50-70 percent of the total production, forbs 10-20 percent and shrubs 20-30 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:** Invasive species include cheatgrass, clasping pepperweed, beggar ticks, tansymustard, Jim Hill tumbledustard, yellow salsify, burr buttercup, medusahead, Russian thistle, annual kochia, leafy spurge and spotted knapweed.

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