

Ecological site R012XY017ID Shallow Fractured South 8-12 PZ ARTRW8/PSSPS-LESAS2

Last updated: 9/22/2020
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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>

Ecological site concept

Site does not receive additional water.

Soils are:

Not saline or saline-sodic.

Shallow to very deep, with >35% (by volume) coarse fragments, skeletal within 20" of soil surface over fractured bedrock.

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

textures usually range from sandy loam to 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

R012XY007ID	Shallow Gravelly Loam 8-12 PZ ARAR8/PSSPS-ACHY
R012XY019ID	Fragile Lands <8 PZ ATCO/LESAS2
R012XY026ID	Dry Loamy 7-10 PZ ATCO-ARFR4/PSSPS
R012XY001ID	Limy Gravelly 8-13 PZ ARNO4/PSSPS
R012XY004ID	Gravelly Loam 8-12 PZ ARTRW8/PSSPS

Similar sites

R012XY004ID	Gravelly Loam 8-12 PZ ARTRW8/PSSPS
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i> (2) <i>Leymus salinus</i> ssp. <i>salmonis</i>

Physiographic features

This site occurs on steep mountain slopes on predominantly south and west aspects. Slopes range from 30-70 percent. Elevation ranges from 4500 to 7000 feet (1350-2200 meters).

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	1,372–2,134 m
Slope	30–70%
Aspect	S, W

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

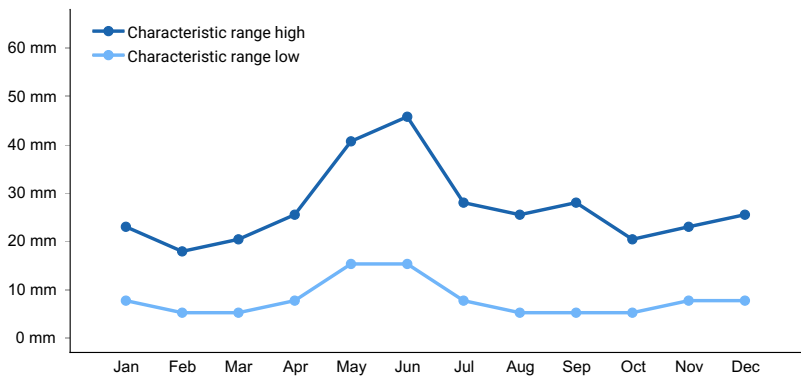


Figure 1. Monthly precipitation range

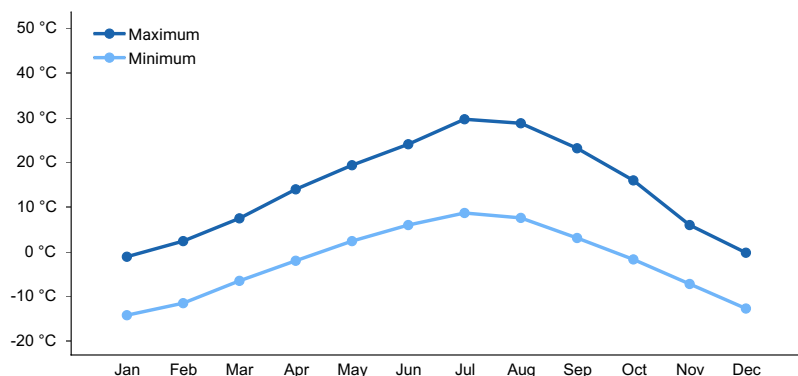


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils on this site are gravelly to extremely gravelly loams and sandy loams over fractured bedrock. They are shallow to very deep and are well drained. Gravels are greater than 50 percent by volume. Available water capacity is very low to low. The effective rooting depth is limited by the depth to bedrock. The soils have a slow to moderately rapid permeability. Organic matter content is low. Water erosion is high due to excessive slopes over 15 percent. These soils are characterized by an aridic soil moisture regime or an aridic bordering on xeric. The soil temperature regime is frigid.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Very gravelly sandy loam
Drainage class	Well drained
Permeability class	Slow to moderately rapid
Soil depth	25–152 cm
Surface fragment cover ≤3"	15–40%
Surface fragment cover >3"	0–15%
Available water capacity (0-101.6cm)	1.27–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume ≤3" (Depth not specified)	40–75%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

The dominant visual aspect of the site is Wyoming big sagebrush in the overstory with bluebunch wheatgrass and

Salmon wildrye in the understory. The composition by weight is 50-70 percent grasses, 10-20 percent forbs and 20-30 percent shrubs.

During the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer, pronghorn antelope, lagomorphs and small rodents. Fire has historically occurred on the site at intervals of 80-100 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 bluebunch wheatgrass and Salmon wildrye in the understory and Wyoming big sagebrush in the overstory. Subdominant species include Sandberg bluegrass, Indian ricegrass, Hoods phlox and cushion eriogonum. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 325 pounds per acre (361 kilograms per hectare) in a normal year. Production in a favorable year is 500 pounds per acre (560 kilograms per hectare). Production in an unfavorable year is 175 pounds per acre (194 kilograms per hectare). Structurally, cool season perennial bunchgrasses are dominant, followed by medium shrubs being more dominant than perennial forbs.

FUNCTION

This site is suited for grazing by domestic livestock in the late spring and fall. There is not an abundance of naturally occurring water where this site occurs.

This site is used by mule deer, pronghorn antelope and sage grouse. Chukars, rattlesnakes, songbirds and small mammals are common on this site.

This site offers limited opportunity for hiking, hunting and photography.

Impacts on the Plant Community

Influence of fire:

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

When fires become more frequent than historic levels (80-100 years), Wyoming big sagebrush and Salmon wildrye is reduced significantly. Green rabbitbrush can increase slightly. With continued short fire frequency, Wyoming big sagebrush can be completely eliminated along with many of the desirable understory species such as Salmon wildrye, bluebunch wheatgrass and Indian ricegrass. Sandberg bluegrass will increase along with a variety of annual and perennial forbs including noxious and invasive species. Cheatgrass and medusahead 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. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to increase in Wyoming big sagebrush and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing these fine fuels that carry fires. As cheatgrass and/or medusahead increases and becomes 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 these fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in Wyoming 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 increase cheatgrass and/or medusahead which will lead to more frequent fire intervals and the loss of valuable wildlife habitat.

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

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. The sagebrush defoliator moth (*Aroga websterii*) causes mortality in relatively small patches.

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 all seasons. Their numbers are seldom high enough to adversely affect the plant community. Burrowing rodents can create microsites for establishment of noxious and invasive plants.

Watershed

Decreased infiltration and increased runoff occur with an increase in Wyoming 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.

Influence of Utah juniper invasion

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

- Utah juniper is very drought tolerant.
- It has the ability to extract soil moisture from a wide range of soil depths.
- Utah 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.
- Utah 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, Utah juniper gains control of energy capture.

As Utah 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 Utah 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 Utah juniper cover and density results in greater plant and soil disturbance between the canopies.

In summary, a closed Utah 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 Utah juniper canopy always results in a transition across the threshold to a different state. Generally, when Utah 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 with improper grazing management and in the absence of fire.

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

Phase A to D. Develops with fire.

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

Phase B to D. Develops with prescribed burning or fire.

Phase C to A. Develops with prescribed grazing, prescribed burning, or fire.

Phase C to D. Develops with prescribed burning or fire

Phase D to A. Develops with no fire and prescribed grazing.

State 1 Phase B to State 2 Phase A. Occurs with no fire and continued improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

State 1 Phase D to State 2 Phase B. Develops with frequent fire and improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

State 1 Phase C to State 3. Develops with no fire and/or improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

State 2.

Phase A to B. Develops with improper grazing management and fire.

Phase B to A. Develops with no fire.

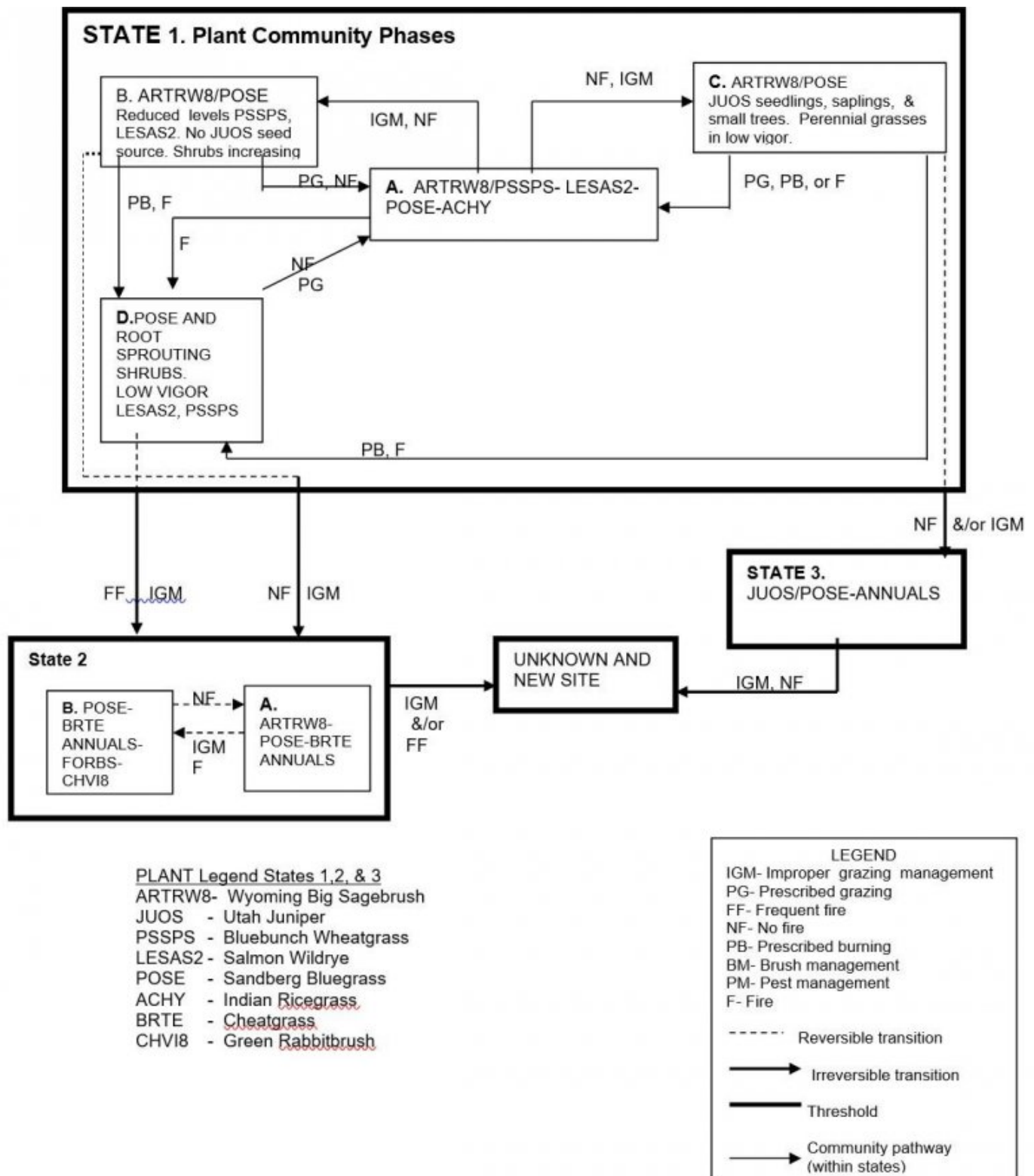
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fire cause this state to cross a threshold and retrogress to a new site with reduced potential. It is not economically practical to return this plant community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

State 3 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and no 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 implementation of facilitating practices. Stony, gravelly soils and steep slopes limit seeding on this site with ground moving equipment. Brush management is usually limited to control with chemicals or prescribed burning. Removal of Wyoming big sagebrush can cause a significant increase of cheatgrass.

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 Wyoming big sagebrush in the overstory and bluebunch wheatgrass and Salmon wildrye in the understory. Subdominant species include Sandberg bluegrass, Indian ricegrass, Hoods phlox and cushion erigonum. Natural fire frequency is 80-100 years.

State 2

State 1, Phase B

Community 2.1

State 1, Phase B

This plant community is dominated by Wyoming big sagebrush with reduced amounts of bluebunch wheatgrass, Salmon wildrye, Indian ricegrass and other deep-rooted bunchgrasses. Sandberg bluegrass has increased in the understory. There is no Utah juniper seed source in the vicinity. All deep-rooted bunchgrasses are typically in low vigor. Wyoming big sagebrush has increased. This phase has developed due to improper grazing management and lack of fire. Some cheatgrass may have invaded the site.

State 3

State 1, Phase C

Community 3.1

State 1, Phase C

This plant community is dominated by Wyoming big sagebrush and Sandberg bluegrass. Utah juniper seedlings and saplings are present. Salmon wildrye and bluebunch wheatgrass are in low vigor. This phase has developed from no fire and improper grazing management.

State 4

State 1, Phase D

Community 4.1

State 1, Phase D

This plant community is dominated by Sandberg bluegrass and root-sprouting shrubs. Forbs remain about in the same proportion as Phase A. Wyoming big sagebrush has been reduced significantly due to wildfire. Salmon wildrye and bluebunch wheatgrass have low vigor but will likely recover. Some cheatgrass may have invaded the site. This plant community is the result of prescribed burning or fire.

State 5

State 2, Phase A

Community 5.1

State 2, Phase A

This plant community is dominated by Wyoming Big Sagebrush, Sandberg bluegrass, cheatgrass and other annuals. Some soil loss has occurred. This state has developed due to no fire and improper grazing management from Phase B, State 1 or with no fire from Phase B, State 2. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

State 6

State 2, Phase B

Community 6.1

State 2, Phase B

This plant community is dominated by Sandberg bluegrass, cheatgrass and other annuals. Root sprouting shrubs such as rabbitbrush can be present. Some soil loss has occurred. This state has developed due to frequent fires and improper grazing management from Phase D, State 1 or from improper grazing management and fire from Phase A, State 2. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

State 7

State 3

Community 7.1

State 3

This plant community is dominated by Utah juniper in the overstory. Shrub and perennial grass cover is significantly reduced. Sandberg bluegrass and a variety of annuals occupy the interspaces between the trees. Soil loss has occurred. This state has developed from a lack of fire and/or improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 with accelerating practices.

State 8

Unknown new site

Community 8.1

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, pronghorn antelope, and elk. 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 may include Great Basin ground squirrel, Idaho pocket gopher, and Merriam's shrew. 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 avian species become rare including sage-grouse, brewer's sparrow, sage sparrow, and sage thrasher. Encroachment of noxious and invasive plant species (cheatgrass) can replace native plant species which provide feed, brood-rearing, and nesting cover for a variety of native wildlife. Water features are sparse provided by seasonal streams, artificial water catchments, and springs.

State 1 Phase 1.1 - Wyoming Big Sagebrush/ Bluebunch Wheatgrass/ Salmon Wildrye/ Sandberg Bluegrass/ Indian Ricegrass 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 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. Shrub-steppe obligate avian species include the Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Critical habitat (brood-rearing, nesting areas, winter cover and food) for sage grouse is provided by this diverse plant community. The plant community supports the seasonal needs of large mammals (mule deer, elk, and antelope) providing forage and young of year cover. Wyoming big sagebrush is a preferred browse for large mammals. A diverse small mammal population including jackrabbit, deer mouse, Great Basin kangaroo rat, and golden-mantled ground squirrels may utilize this plant community.

State 1 Phase 1.2 - Wyoming Big Sagebrush/ Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. 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, western skink, and western rattlesnake. The reduced diversity

of insects may reduce reptile diversity and populations. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Key shrub-steppe obligate avian species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Critical habitat (brood-rearing and nesting cover) for sage-grouse is limited due to a less diverse herbaceous plant community. The reduced vigor of understory vegetation provides a shorter forage season for mule deer. Wyoming big sagebrush is a preferred browse for wild ungulates. Young of the year cover would be provided for deer and antelope. A diverse small mammal population including golden-mantled ground squirrels, jackrabbits, and deer mice would utilize this plant community.

State 1 Phase 1.3 - Wyoming Big Sagebrush / Sandberg Bluegrass/ Utah Juniper Plant Community: This plant community is the result of improper grazing and no fire. 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 community 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 cover 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 food habitat during spring and fall for mule deer, elk, and antelope. As juniper encroachment occurs, the site will provide additional thermal 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 1.4 - Sandberg Bluegrass/ Rabbitbrushes Plant Community: This plant community is the result of fire. Large areas of Phase 1.4 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 due to a loss of sagebrush but a native forb plant community similar to State 1 Phase 1.1 would still support select pollinators. Quality of reptile habitat, including short horned lizard, sagebrush lizard, and western rattlesnakes would decline due to the absence of sagebrush. The dominance of herbaceous vegetation with little sagebrush canopy cover would reduce use of these areas for nesting by Brewer's sparrow, sage sparrow, and sage thrasher. This plant community provides brood-rearing habitat for sage-grouse when sagebrush cover is nearby. The site does not provide suitable winter habitat or nesting cover for sage grouse. The herbaceous vegetation improves habitat for grassland avian species (horned lark, grasshopper sparrow, vesper sparrow, savannah sparrow, and western meadowlark). Large mammal (mule deer, antelope) use for foraging would be seasonal, but the site would offer little thermal cover and young of year cover.

State 2 Phase 1.1 - Wyoming Big Sagebrush/ Sandberg Bluegrass/ Cheatgrass/ Annuals Plant Community: This plant community is the result of improper grazing management and no fire from State 1 Phase 1.2. 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, western skink, and western rattlesnake. The reduced diversity of insects may reduce reptile diversity and populations. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Key shrub-steppe obligate avian species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Critical habitat (brood-rearing and nesting cover) for sage-grouse is limited due to a less diverse herbaceous plant community. The reduced vigor of understory vegetation provides a shorter forage season for mule deer. Wyoming big sagebrush is a preferred browse for wild ungulates. Young of year cover would be provided for deer and antelope. A diverse small mammal population including golden-mantled ground squirrels, jackrabbits, and deer mice would utilize this plant community.

State 2 Phase 1.2 - Sandberg Bluegrass/ Cheatgrass and Annual Plant Community: This plant community is the result of continued improper grazing management and frequent fire. Large areas of State 2 Phase 1.2 would fragment the reference plant community and would reduce the quality of the habitat for shrub-steppe obligate animal species. The loss of the native shrub and herbaceous plant community would not support a diverse insect community. Patches of rabbitbrush may occur on site and provide vertical structure and fall pollinator habitat. Ants and grasshoppers may dominate the insect community. Most native reptilian species are not supported with food, water, or cover. This plant community does not support the habitat requirements for sage-grouse, sage thrasher, Brewer's sparrow, or sage sparrow. Diversity of bird 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. Small mammal populations and diversity would be dominated by open grassland species like the Columbian ground squirrel. Hunting success by predators for small mammals may increase with the loss of suitable cover.

State 3 – Utah Juniper/ Sandberg Bluegrass/Annuals Plant Community: This state has developed due to improper grazing management and/or no fire. The loss of native forbs and understory vegetation will reduce insect diversity on the site. The lack of flowering plants reduces habitat for pollinators like butterflies and moths. Quality of habitat for reptilian species identified in State 1 Phase 1.1 are limited for food, water, or cover. This plant community does not support the habitat requirements for sage-grouse. 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. Hunting success by raptors may decrease due to a heavy overstory of juniper. The plant community supports limited seasonal habitat for mule deer, elk, and antelope in the spring and fall. As juniper encroachment occurs the site will provide additional thermal cover for large mammals.

Grazing Interpretations

This site is suited for grazing by domestic livestock in the late spring and fall. There is a lack of abundance of naturally occurring water where this site occurs.

Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use and seasonal preference. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings.

Hydrological functions

Soils on this site are in hydrologic group D. The runoff hazard is high

Recreational uses

This site offers limited opportunity for hiking, hunting 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:

Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC

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Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho

Lee Brooks, Range Management Specialist, IASCD

Kristen May, Resource Soil Scientist, NRCS, Idaho

Other references

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Approval

Kendra Moseley, 9/22/2020

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	02/04/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** Rills rarely occur on this site. If rills are present, they are most likely to occur after a hard rain for several continuous days, rain on frozen ground and immediately following wildfire.

- Presence of water flow patterns:** Water flow patterns rarely occur on this site except following a hard rain over several continuous days or after a rain on frozen ground event. When they occur they are short, disrupted by cool season perennial grasses, medium shrubs, surface gravel and are not extensive.

- Number and height of erosional pedestals or terracettes:** Pedestals are rare on this site. Do not misinterpret frost heaving for pedestals. Terracettes are rare.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Data not available. On sites in mid-seral status, bare ground may range from 70-80 percent. ADDITIONAL DATA IS NEEDED.
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5. **Number of gullies and erosion associated with gullies:** Gullies do not occur on this site.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind scoured, blowouts and/or depositional areas usually does not occur. Some wind erosion may occur immediately following a wildfire on soils that have fine textured surface soils.
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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move less than 2 feet following a significant run-off event. Coarse litter generally does not move.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values should range from 4 to 6 but need to be tested.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A or A1 horizon is typically 1 to 7 inches thick. Structure ranges from weak and moderate very fine and fine granular to weak and moderate thin and thick platy to weak fine subangular blocky. Soil organic matter (SOM) ranges from 1 to 3 percent.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses, especially deep-rooted, slow run-off and increase infiltration. Shrubs accumulate snow in the interspaces. Terracettes, when present, provide a favorable micro-site for vegetation establishment which further increases infiltration.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Compaction layer is not present.
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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant: Cool season perennial bunchgrasses >>
- Sub-dominant: Medium shrubs>perennial forbs.
- Other:
- Additional:
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Wyoming big sagebrush will become decadent in the absence of browsing or fire. Grass and forb mortality will occur as medium shrubs increase.
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14. **Average percent litter cover (%) and depth (in):** Annual litter cover in the interspaces will be 3-10 percent to a depth of <0.1 inch. Under the mature shrubs, litter is greater than 0.5 inches.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production is 325 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 50-70 percent of the total, forbs 10-20 percent and shrubs 20-30 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 species include cheatgrass, halogeton, tansy mustard, rush skeletonweed, scotch thistle, spotted and diffuse knapweed.
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17. **Perennial plant reproductive capability:** All functional groups have the potential to reproduce in normal and favorable years.
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