USDA Natural Resources
Conservation Service

Ecological site R012XY034ID
Clayey 12-16 PZ ARARL/FEID

Last updated: 12/11/2019
Accessed: 05/02/2024

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 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 longiloba/ 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.
Moderately deep to very deep, with >35% (by volume) coarse fragments, skeletal within 20” of the soil surface.
Not strongly or violently effervescent in the to 20” of the soil profile.
textures usually range from silty clay to clay in surface mineral 4”.
Slope is < 30%.
Clay content is = >35% in surface mineral 4”.

Associated sites

R012XY012ID	**Loamy 12-16 PZ ARTRV/FEID-PSSPS**
R012XY020ID	**Clayey 13-16 PZ ARAR8/FEID**
R012XY029ID	**Clayey South Slope 12-16 PZ ARAR8/PSSPS**

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Artemisia arbuscula ssp. longiloba*
Herbaceous	(1) *Festuca idahoensis*

Physiographic features

This site occurs on basalt plains, fans and footslopes. Slopes are usually less than 30 percent and occur on all aspects. Elevation ranges from 4800-6500 feet (1400-2000 meters).

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Fan
Elevation	1,463–1,981 m
Slope	1–30%

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

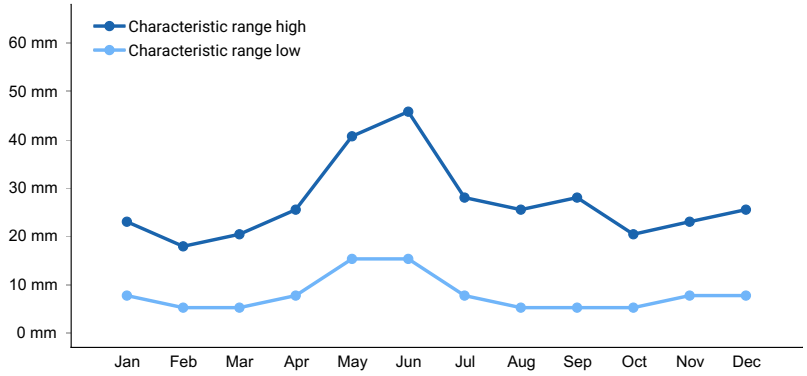


Figure 1. Monthly precipitation range

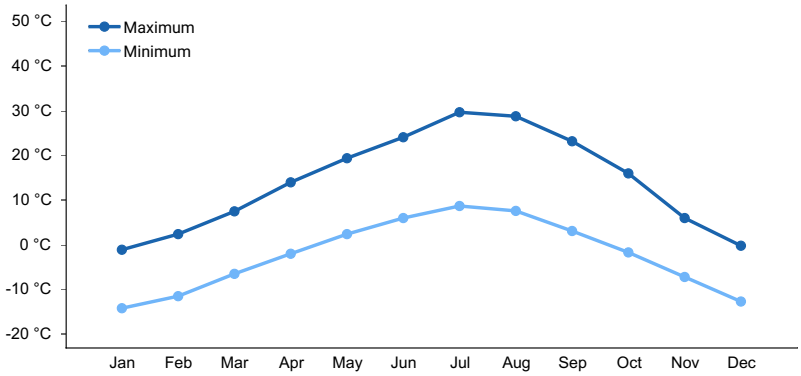


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils on this site have loam surface textures and clay or silty clay subsoils. Coarse fragments are generally present in the soil profile. The soils are very deep and have moderately slow to no permeability. The clayey subsoil prevents water and root penetration below 14-18 inches. Water intake is slow. The soils are well drained. The available water holding capacity is low to moderate. Runoff is very high. Water erosion can be high when plant cover is reduced. The soils have a xeric soil moisture regime. The soil temperature regime is cryic.

Table 4. Representative soil features

Surface texture	(1) Very gravelly loam (2) Stony
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	152 cm
Surface fragment cover <=3"	10–30%
Surface fragment cover >3"	0–15%
Available water capacity (0-101.6cm)	7.87–16.51 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	15–50%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

The dominant visual aspect of this site is alkali sagebrush, Idaho fescue and bluebunch wheatgrass. Composition by weight is approximately 45-55 percent grasses, 10-20 percent forbs and 30-40 percent shrubs.

During the last few thousand years, this site has evolved in an arid climate characterized by warm, dry summers and cold, wet winters. Herbivory has historically occurred on the site at low levels of utilization. Herbivores include Rocky Mountain elk, pronghorn antelope, mule deer, sage grouse, lagomorphs and small rodents. Fire has historically occurred on this site every 50-70 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 Idaho fescue and alkali sagebrush. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

Total annual production is 650 pounds per acre (728 Kg/ha)in a normal year. Production in a favorable year is 1050 pounds per acre (1176 Kg/ha). Production in an unfavorable year is 400 pounds per acre (448 Kg/ha). Structurally, cool season, deep-rooted perennial bunchgrasses are very dominant, followed by medium height shrubs being more dominant than perennial forbs while shallow rooted perennial bunchgrasses are sub-dominant.

FUNCTION:
This site is suited for grazing by domestic livestock in late spring to early summer after the soil has dried to prevent trampling damage and it provides fair to good habitat for various upland wildlife species. Mule deer, pronghorn and sage grouse make use of the site throughout the year.

The site offers minimal recreation or aesthetic values.

This site can be degraded easily by improper grazing management due to the moderate slopes which allows easy access to domestic livestock. The site is most commonly degraded by grazing when the soils are wet.

Impacts on the Plant Community.

Influence of fire:
This site historically had a relatively low fire frequency, approximately every 50-70 years. Most of the shrubs evolved in the absence of fire; therefore, they can be severely damaged or killed when burned. Idaho fescue, Nevada bluegrass and Thurber’s needlegrass can be lost or sustain reduced vigor after a fire. Rabbitbrush species can increase with fire. Cheatgrass and/or medusahead can be trouble-some invaders on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency. Sandberg bluegrass is usually maintained in the community.

In the absence of fire, alkali sagebrush will gradually increase. Grasses and forbs will decrease as shrubs increase. If there is a Utah juniper seed source in the vicinity, juniper will invade the site. See “Influence of juniper invasion” below.

Season-long grazing, excessive utilization and grazing when the soils are wet can be detrimental to this site. This type of management leads to reduced vigor of Idaho fescue, bluebunch wheatgrass and other deep-rooted perennial bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in alkali sagebrush and invasive plants.

Continued improper grazing management influences fire frequency with an increase in cheatgrass or medusahead and other annuals. If cheatgrass and/or medusahead increase and become co-dominant with Sandberg bluegrass and other annuals, fires become more frequent.

Weather influences:
Above normal precipitation in April, May and June can dramatically increase total annual production. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. 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. An outbreak of a particular insect is usually influenced by weather but no specific data is available for this site.

Influence of noxious and invasive plants:
Annual and perennial invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory. Cheatgrass and medusahead can be very invasive on this site, especially after fire. Once they become established the fire frequency increases. As a result, the shrub component can be lost.

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

Watershed:
Decreased infiltration and increased runoff on slopes greater than 10 percent occur when alkali sagebrush is removed with frequent fires, particularly the year following the fire event. The increased runoff also increases sheet and rill erosion. 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 hydrologic 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 in the absence of fire. No Utah juniper seed source in the proximity.
Phase A to C. Usually results from the absence of fire and improper grazing management. A Utah juniper seed source is present.
Phase A to D. Results from one or more fires.
Phase A to E. Develops with improper grazing management and in the absence of fire. No Utah juniper seed source is present.
Phase B to A. Results from prescribed grazing management.
Phase B to D. This develops from prescribed burning or fire.
Phase C to A. Develops with prescribed grazing management and prescribed burning or fire.
Phase C to D. This develops from prescribed burning or fire.
Phase D to A. Usually results from prescribed grazing management and no fire.
Phase E to A. Develops from prescribed grazing management and prescribed burning or brush management.
Phase E to D. This develops from prescribed burning or fire.

State 1 Phase E to State 2 Phase A. Results from continued lack of fire and improper grazing management. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 1 Phase D to State 2, Phase B. Develops through frequent fire and improper grazing management. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

State 1 Phase C to State 3. Results from improper grazing management and lack of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 2 Phase A to State 2 Phase B. Results from improper grazing management and fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 2 Phase B to State 2 Phase A. Results from no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

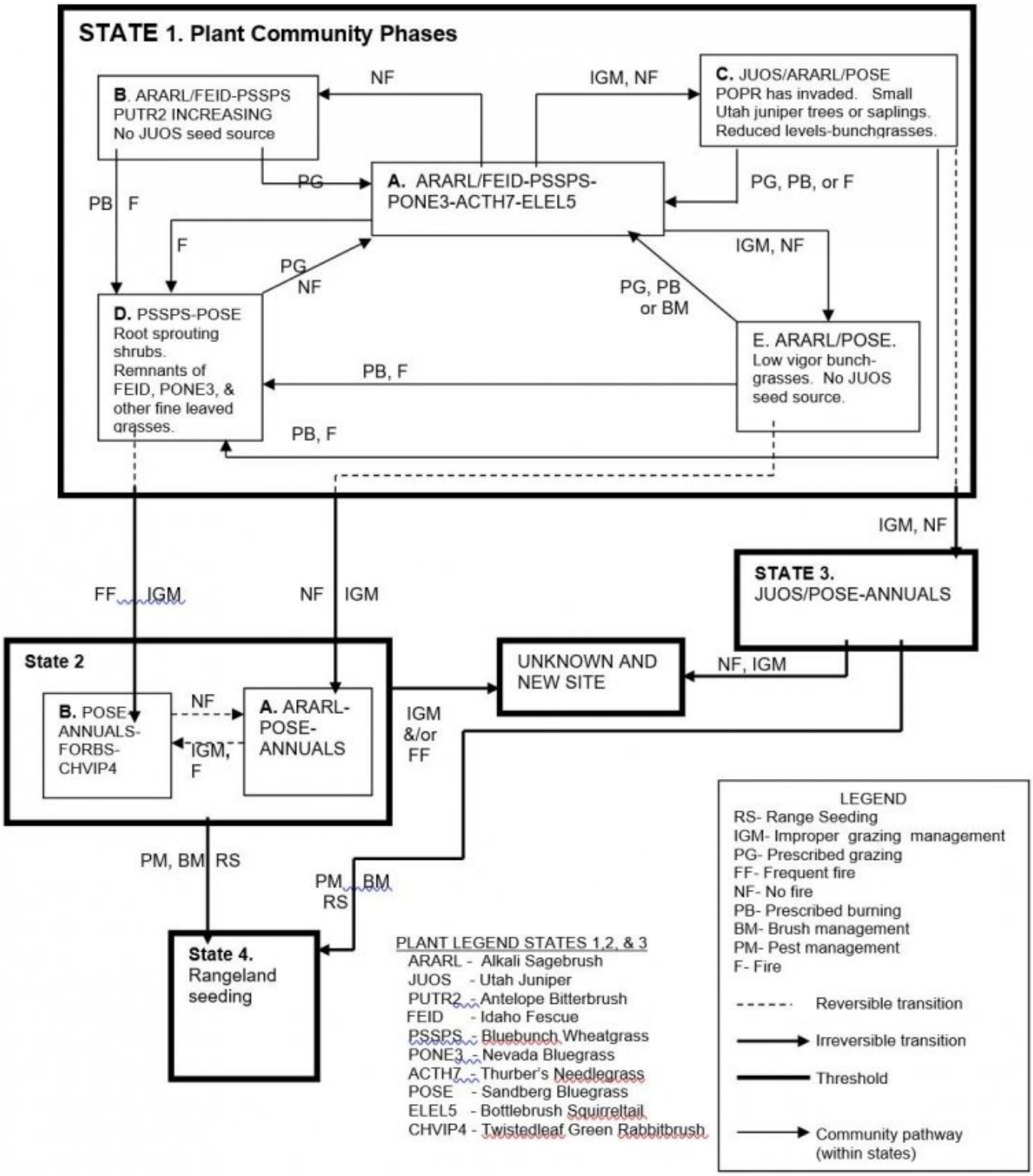
State 2 or State 3 to State 4. Results from rangeland seeding.

State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and/or frequent fire cause this state to cross the threshold and retrogress to a new site with reduced potential. It is uneconomical to return this community to State 1 through accelerated practices.

State 3 to unknown site. Continued lack of fire and 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 uneconomical to return this community to State 1 through accelerated practices.

Practice Limitations.
Slight to moderate limitations exist for implementing vegetative management and accelerating practices. Clayey soils must be considered when planning grazing systems with spring use and implementing proposed seedings. Slight limitations exist for implementing facilitating practices on this site.

State and transition model



Animal community

Wildlife Interpretations
Animal Community – Wildlife Interpretations

This rangeland ecological site provides habitat for a variety of native wildlife species. Large herbivore use of the reference plant community is dominated by mule deer, elk, and pronghorn antelope. The site can provide winter habitat for mule deer and antelope. The site provides important seasonal habitat 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. Sage-grouse and Idaho pocket gopher are area sensitive species that may be present on this site. In isolated areas encroachment of

noxious and invasive plant species (cheatgrass, medusahead, and bulbous bluegrass) 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 – Alkali Sagebrush/ Idaho Fescue/ Bluebunch Wheatgrass/ Nevada Bluegrass/ Thurber's Needlegrass/ Bottlebrush Squirreltail 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, and western toad. 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. Birds that may be resident or migratory include mountain bluebird, lazuli bunting, vesper sparrow, grasshopper sparrow, and lesser goldfinch. Brood-rearing, winter cover, and winter food habitat for sage grouse is provided by this diverse plant community. The plant community provides spring, fall, and winter forage needs for large mammals including mule deer and pronghorn. Mule deer and pronghorn have a preference for alkali sagebrush and antelope bitterbrush. A diverse small mammal population may include Idaho pocket gopher, golden-mantled ground squirrels, marmots, and chipmunks.

State 1 Phase 1.2- Alkali Sagebrush/ Idaho Fescue/ Bluebunch Wheatgrass/ Antelope Bitterbrush Plant Community: This phase has developed due to fire frequency being much longer than normal. An increase in canopy cover of sagebrush and bitterbrush contributes to a decline in herbaceous understory. Insect diversity and populations would be similar to State 1 Phase 1.1. The reptile community will be similar to the State 1 Phase 1.1 community represented by leopard lizard, short horned lizard, sagebrush lizard, and western skink. Sagebrush will provide brood-rearing habitat, winter cover, and winter food for sage-grouse. The plant community supports seasonal forage habitat for mule deer and pronghorn. As bitterbrush encroaches, the site will provide limited thermal and young of year for large mammals. An increase in bitterbrush may increase the quality of winter habitat for mule deer and pronghorn. A diverse small mammal population may include Idaho pocket gopher, golden-mantled ground squirrels, marmots, and chipmunks.

State 1 Phase 1.3 – Utah Juniper/ Alkali Sagebrush/ Sandberg Bluegrass/ Kentucky Bluegrass Plant Community: This phase has developed due to improper grazing management and lack of fire. An increase in canopy cover of 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 alkali sagebrush provides brood-rearing habitat for sage-grouse, but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community supports limited seasonal habitat for mule deer and pronghorn. As juniper encroaches, the site will provide additional thermal and young of year cover for large mammals. A small mammal population including golden-mantled ground squirrels, chipmunks, deer mice, and yellow-bellied marmots may utilize this site.

State 1 Phase 1.4 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Rabbitbrushes 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. Insect diversity would be reduced with the loss of sagebrush but a native forb plant community similar to State 1 Phase 1.1 would still support select pollinators. Encroachment of rabbitbrush would add fall pollinator habitat to the site over time. As rabbitbrush matures it would help replace the loss of sagebrush cover. Until rabbitbrush is established, diversity and populations of native reptiles would be limited or excluded. The dominance of herbaceous vegetation with no sagebrush canopy cover would eliminate use of this area for winter cover and winter food for sage-grouse. This plant community provides limited brood-rearing habitat for sage-grouse if site is adjacent to sagebrush cover. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark, western meadowlark, vesper sparrow, and grasshopper sparrow). Winter habitat for pronghorn and mule deer would be reduced or eliminated with the loss of sagebrush and bitterbrush. Small mammal diversity and populations would be reduced due to loss of cover and increase in success of hunting by predators.

State 1 Phase 1.5 - Alkali Sagebrush/ Sandberg Bluegrass Plant Community: This phase has developed due to improper grazing management and a lack of fire. An increase in canopy cover of sagebrush 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 the 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 sagebrush increases, habitat for Brewer's sparrow, sage thrasher, and sage sparrow may increase. Quality of brood-rearing habitat for sage-grouse would decline with the loss of vigor and amount of forbs and deep-rooted perennial bunch grasses. Winter cover and winter food for sage-grouse would still be provided. The plant community provides important winter habitat for mule deer and antelope. A small mammal population may include Idaho pocket gopher, golden-mantled ground squirrels, and chipmunks.

State 2 Phase 2.1 - Alkali Sagebrush/ Sandberg Bluegrass/ Annuals Plant Community: This phase has developed due to improper grazing management and a lack of fire. An increase in canopy cover of sagebrush and noxious weeds contributes to a sparse native 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 but the quality of habitat has been severely reduced. As sagebrush increases, habitat cover for Brewer's sparrow, sage thrasher, and sage sparrow may increase. Quality of brood-rearing habitat for sage-grouse would decline with the loss of vigor and amount of forbs and deep-rooted perennial bunch grasses. Winter cover and winter food for sage-grouse would still be provided. The plant community provides winter habitat for mule deer and pronghorn. A small mammal population would include Idaho pocket gopher, golden-mantled ground squirrels, and chipmunks.

State 2 Phase 2.2 - Sandberg Bluegrass/ Annuals/ Forbs/ Green Rabbitbrush Plant Community: This plant community is the result of continued improper grazing management and fire. The reduced forb and shrub components in the plant community would support a very limited population of pollinators. Most reptilian species identified in State 1 Phase 1.1 are not supported with food, water, or cover. This plant community does not support any of the habitat requirements for sage-grouse. Diversity of grassland avian species is reduced due to poor cover and available food. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Hunting success by raptors may increase. Mule deer and pronghorn 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. Winter habitat for mule deer and pronghorn would not be available. Small mammal populations and diversity would be reduced due to poor quality cover and food, and an increase in success of hunting by predators.

State 3 – Utah Juniper/ Sandberg Bluegrass/ Annuals: This state has developed due to improper grazing management and no fire. The loss of native understory vegetation will reduce insect diversity on the site. The lack of flowering plants reduces use by pollinators like butterflies and moths. The quality of habitat for reptiles is severely reduced, resulting in a less diverse population. 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 provides limited seasonal habitat for mule deer in spring and fall. Winter habitat for mule deer may increase in value. As juniper encroaches, the site will provide additional thermal and young of year cover for large mammals.

State 4 – 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 1.4. 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. Grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat, mule deer, and pronghorn would utilize this site for nesting and/or seasonal foraging. Birds of prey including hawks and falcons may range throughout these areas looking for prey species.

Grazing Interpretations

This site is suited for grazing by domestic livestock in late spring to early summer after the soils have dried out and firmed up enough to prevent trampling damage.

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. When ground cover is at or near potential, the erosion hazard is moderate.

Recreational uses

The site offers minimal recreation or aesthetic values.

Wood products

None.

Other products

None.

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used.
Those involved in developing this site description include:
Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC
Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC
Jim Cornwell, Range Management Specialist, IASCD
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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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, 12/11/2019

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	01/16/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills can occur on the site. If they do occur, it will normally be on slopes greater than 10%.

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2. **Presence of water flow patterns:** Water flow patterns may be present on this site. When they do occur, they are short and disrupted by cool season grasses, shrubs and surface gravel. They are not extensive.

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3. **Number and height of erosional pedestals or terracettes:** Erosional pedestals or terracettes can occur on the site. They are most likely to occur where water flow patterns are present and surface stones are absent. Do not mistake frost heaving for pedestals.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 25-35 percent but more 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 do not occur.

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter moves by wind or water. Fine litter can move up to 2 feet after a strong summertime convection storm. Due to the relatively flat slopes, large litter 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):

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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 2 to 6 inches thick. Structure ranges from moderate very fine and fine granular to weak very fine and fine subangular blocky. Soil organic matter (SOM) ranges from 2 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 runoff and increase 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 deep-rooted perennial bunchgrasses>> medium shrubs>

    Sub-dominant: Perennial forbs>shallow-rooted bunchgrasses

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little mortality or decadence is expected on this site. Mortality of shallow rooted grasses may occur due to extended periods of drought.

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production is 650 pounds per acre (728 Kg/ha)in a year with normal precipitation and temperatures. Perennial grasses produce 45-55 percent of the total production, forbs 10-20 percent and shrubs 30-40 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, medusahead, Vulpia species, bulbous bluegrass and annual mustards.

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