USDA Natural Resources
Conservation Service

Ecological site R010XA038ID
Stony Clayey 8-16 PZ ARAR8/PSSPS

Last updated: 12/13/2023
Accessed: 05/13/2025

General information

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

MLRA notes

Major Land Resource Area (MLRA): 010X–Central Rocky and Blue Mountain Foothills

This MLRA is characterized by gently rolling to steep hills, plateaus, and low mountains at the foothills of the Blue Mountains in Oregon and the Central Rocky Mountains in Idaho. The geology of this area is highly varied and ranges from Holocene volcanics to Cretaceous sedimentary rocks. Mollisols are the dominant soil order and the soil climate is typified by mesic or frigid soil temperature regimes, and xeric or aridic soil moisture regimes. Elevation ranges from 1,300 to 6,600 feet (395 to 2,010 meters), increasing from west to east. The climate is characterized by dry summers and snow dominated winters with precipitation averaging 8 to 16 inches (205 to 405 millimeters) and increasing from west to east. These factors support plant communities with shrub-grass associations with considerable acreage of sagebrush grassland. Big sagebrush, bluebunch wheatgrass, and Idaho fescue are the dominant species. Stiff sagebrush, low sagebrush, and Sandberg bluegrass are often dominant on sites with shallow restrictive layers. Western juniper is one of the few common tree species and since European settlement has greatly expanded its extent in Oregon. Nearly half of the MLRA is federally owned and managed by the Bureau of Land Management. Most of the area is used for livestock grazing with areas accessible by irrigation often used for irrigated agriculture.

For further information, see "Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin (U.S. Department of Agriculture Handbook 296, 2006)" available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053624

Classification relationships

Artemisia arbuscula/ Agropyron spicatum HT, 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 occurs on uplands
- Slopes generally less than 30%, occurring on all aspects
- Soils are 20" or less
- Site not associated with recent lava flows
- Surface texture is generally Clay Loam to Silty Clay but may be coarser

Associated sites

R010XA004ID	**Loamy 12-16 PZ ARTRV/FEID-PSSPS** Adjacent low slope areas with deeper soils
R010XA009ID	**South Slope Gravelly 12-16 PZ** Adjacent south slopes

R010XA011ID	**Clayey North 16-22 PZ** Adjacent north slopes
R010XA020ID	**Mixed Shrub 12-16 PZ** Adjacent low slope areas with very shallow soils
R010XA021ID	**South Slope Fractured 12-16 PZ** Adjacent south slopes on fractured bedrock
R010XA025ID	**South Slope Loamy 11-13 PZ ARTRW8/PSSPS** Adjacent south slopes
R010XA026ID	**Loamy 11-13 PZ ARTRW8/PSSPS** Adjacent low slope areas

Similar sites

R010XA011ID	**Clayey North 16-22 PZ** Occurring on north slopes greater than 30%
R010XA007ID	**Shallow Stony Loam 8-16 PZ** Surface texture is generally Loam to Silt Loam but may be finer

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia arbuscula*
Herbaceous	(1) *Pseudoroegneria spicata ssp. spicata*

Physiographic features

This site occurs on gently sloping terraces and fans. Slopes range from 1 to 10 percent. Elevations range from 4200 to 5500 feet (1250 to 1700 meters).

Table 2. Representative physiographic features

Landforms	(1) Foothills > Terrace (2) Foothills > Fan
Flooding frequency	None
Ponding frequency	None
Elevation	4,200–5,500 ft
Slope	1–10%
Water table depth	80 in
Aspect	Aspect is not a significant factor

Climatic features

The Big and Little Wood River Foot slopes and Plains, proposed as MLRA 10X, has a mean elevation of 5310 feet above sea level, and varies from 3600 to 9235 feet. In general, average annual precipitation is greatest on the western side, with the southeast area being the driest. The average annual precipitation, based on 7 long term climate stations located throughout the MLRA, is 15.39 inches, with a range of 12.5 to 18 inches. Monthly precipitation is generally greatest at the end of the year, diminishes steadily until a low in July and August, then increases rapidly in the autumn.

Monthly temperatures can vary considerably. Highs of up to 102° and lows down to -52° Fahrenheit have been recorded. The average annual temperature is 42.9°. The frost-free period ranges from 75 to 98 days. The freeze-free period is a bit longer: 106 to 133 days.

Both morning and afternoon average relative humidity values peak in the winter, and reach their low in July and August. The average number of sunny, cloud-free days is above average for the summer months, but below

average for the period from November through February.

Table 3. Representative climatic features

Frost-free period (characteristic range)	75-98 days
Freeze-free period (characteristic range)	106-133 days
Precipitation total (characteristic range)	8-16 in
Frost-free period (actual range)	
Freeze-free period (actual range)	
Precipitation total (actual range)	8-18 in
Frost-free period (average)	86 days
Freeze-free period (average)	120 days
Precipitation total (average)	15 in

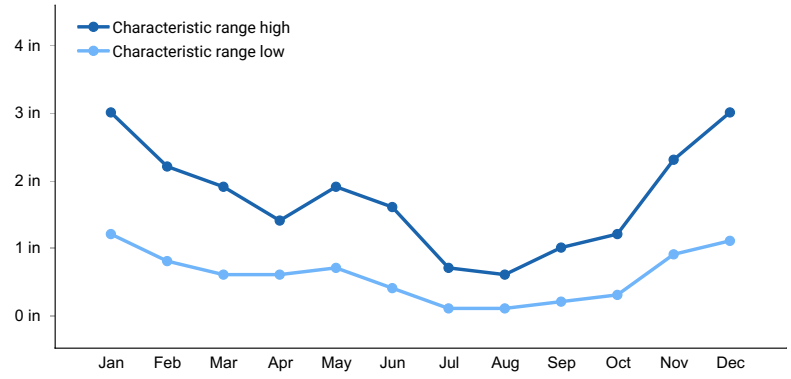


Figure 1. Monthly precipitation range

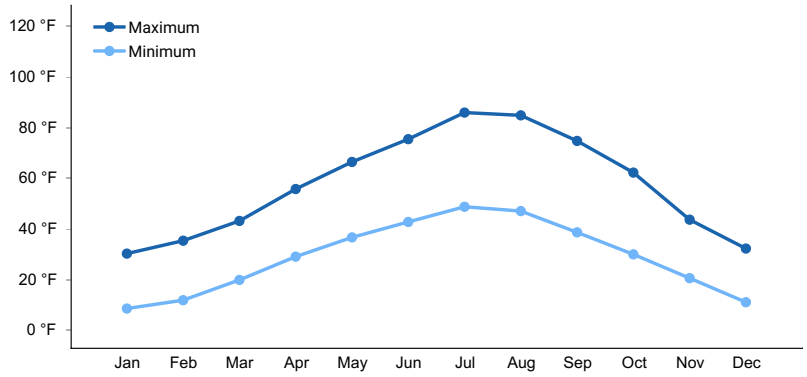


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Wetland description

This site is not influenced by adjacent wetlands.

Soil features

This site occurs on soils derived from loess, basalt and rhyolite. These are moderately deep to deep, well drained soils. Surface texture is generally Clay Loam to Silty Clay but may be coarser. Family particle size class is fine to clayey-skeletal.

Table 4. Representative soil features

Parent material	(1) Colluvium–volcanic rock (2) Residuum–volcanic rock
Surface texture	(1) Clay loam (2) Silty clay
Family particle size	(1) Fine (2) Clayey-skeletal
Drainage class	Well drained
Permeability class	Very slow to moderately slow
Depth to restrictive layer	20–60 in
Soil depth	20–60 in
Surface fragment cover <=3"	0–50%
Surface fragment cover >3"	0–50%
Available water capacity (0-40in)	3–6 in
Soil reaction (1:1 water) (0-40in)	6.1–7.3
Subsurface fragment volume <=3" (4-60in)	0–10%
Subsurface fragment volume >3" (4-60in)	5–45%

Ecological dynamics

The dominant visual aspect of this site is low sagebrush with bluebunch wheatgrass. The composition by weight is approximately 35 to 50 percent grasses, 35 to 45 percent shrubs, and 15 to 20 percent forbs.

During the last few thousand years, this site has evolved in a semi-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 pronghorn antelope, mule deer, sage grouse, lagomorphs, and small rodents.

Fire has historically occurred on this site every 80 to 100 years. Fire occurs only in years with above normal precipitation.

The Reference State (State 1), previously referred to as the Historic Climax Plant Community (HCPC), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases.

FUNCTION:

This site is suited for grazing by livestock in spring, early summer, and fall. It also provides habitat for mule deer, pronghorn antelope, small game, sage grouse, small birds, and rodents. The site provides limited recreational opportunities except early spring flower observation.

This site can be easily degraded by improper grazing management because of the gentle slopes, easy access by livestock, and the low production. The inherent low production on the site makes it susceptible to accelerated degradation. Infiltration and production can be maintained with a mixed stand of deep-rooted perennial bunchgrasses and shrubs. Runoff potential is medium to rapid and the erosion hazard is generally moderate.

Impacts on the Plant Community.

Influence of fire:

This site historically had a very low fire frequency, approximately every 80 to 100 years. Most of the shrubs evolved in the absence of fire, therefore they can be severely damaged when burned. Idaho fescue and Thurber's needlegrass in the community can be lost with a fire. Rabbitbrush species can increase with fire. Cheatgrass and medusahead can be troublesome 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.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be detrimental to this site. This type of management leads to reduced vigor of 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 low sagebrush and invasive plants. Continued improper grazing management influences fire frequency with an increase in cheatgrass and medusahead.

Weather influence:

Above normal precipitation in March, April, and May can dramatically increase total annual production. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Extended periods of drought significantly impact this site due to the shallow soil and resulting low water holding capacity. Extended drought reduces vigor of the perennial grasses and shrubs. Extreme drought may cause plant mortality.

Influence of insects and disease:

Outbreaks can affect vegetation health. Mormon cricket and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak. 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 a 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 are 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 occurs on slopes when low 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.

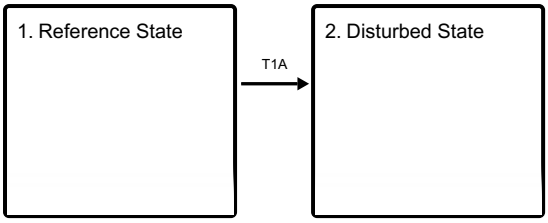
When hydrologic condition of the vegetative cover is good, natural erosion hazard is slight.

Practice Limitations:

Slight limitations exist for implementing vegetation management practices. Early spring grazing should be avoided due to prolonged wetness in the soil. Only slight to moderate limitations exist for implementing facilitating practices on this site. Shallow and stony soils and present severe limitations for range seeding by ground moving equipment and is not generally economically feasible due to low production potential.

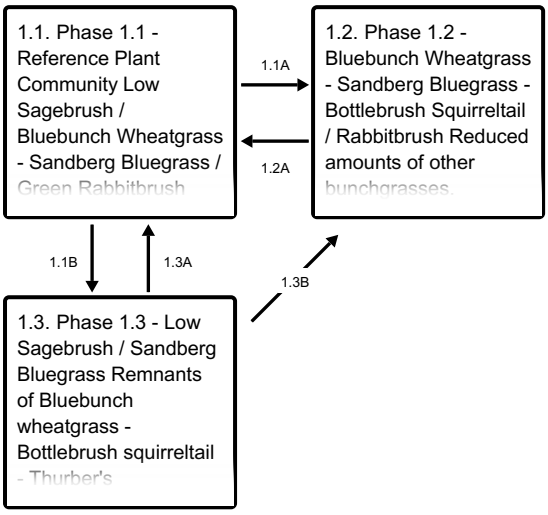
State and transition model

Ecosystem states



T1A - Improper grazing management, frequent fire

State 1 submodel, plant communities



1.1A - Fire

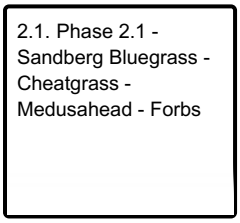
1.1B - Improper grazing management, no fire

1.2A - Prescribed grazing, no fire

1.3A - Prescribed grazing, no fire

1.3B - Fire

State 2 submodel, plant communities



State 1
Reference State

Dominant plant species

- little sagebrush (*Artemisia arbuscula*), shrub
- bluebunch wheatgrass (*Pseudoroegneria spicata ssp. spicata*), grass

Community 1.1
Phase 1.1 - Reference Plant Community Low Sagebrush / Bluebunch Wheatgrass - Sandberg Bluegrass / Green Rabbitbrush

This plant community is dominated by bluebunch wheatgrass and low sagebrush. Sandberg bluegrass and Idaho fescue are the subdominant grass species. Small amounts of bottlebrush squirreltail and Thurber's needlegrass are present. A large variety of forbs are present but each represents a small amount in the community. Forb species in the plant community include longleaf phlox and silky loco milkvetch. Tall green rabbitbrush is a subdominant shrub.

The natural fire frequency is about 80 to 100 years.

Resilience management. The Reference Plant Community Phase is Phase 1.1. The plant species composition of Phase 1.1 is listed later under “Reference Plant Community Phase Plant Species Composition”. Total annual production is 500 pounds per acre (560 Kg/ha) in a normal year. Production in a favorable year is 650 pounds per acre (728 Kg/ha). Production in an unfavorable year is 300 pounds per acre (336 Kg/ha). Structurally, cool season deep rooted perennial bunchgrasses are about equal to shrubs which are more dominant than forbs while shallow rooted perennial bunchgrasses are subdominant.

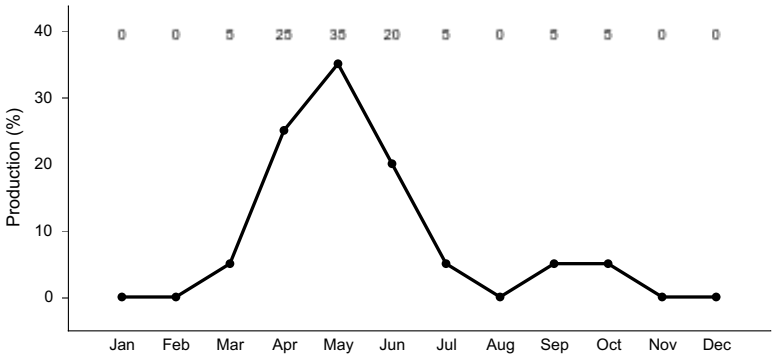


Figure 3. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Community 1.2
Phase 1.2 - Bluebunch Wheatgrass - Sandberg Bluegrass - Bottlebrush Squirreltail / Rabbitbrush Reduced amounts of other bunchgrasses.

Bluebunch Wheatgrass - Sandberg Bluegrass - Bottlebrush Squirreltail / Rabbitbrush Reduced amounts of other bunchgrasses. This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass. Small amounts of Idaho fescue, Thurber’s needlegrass, bottlebrush squirreltail, a variety of forbs, and several species of rabbitbrush can be present. Some Idaho fescue and Thurber’s needlegrass may have died due to fire. This phase has developed due to fire.

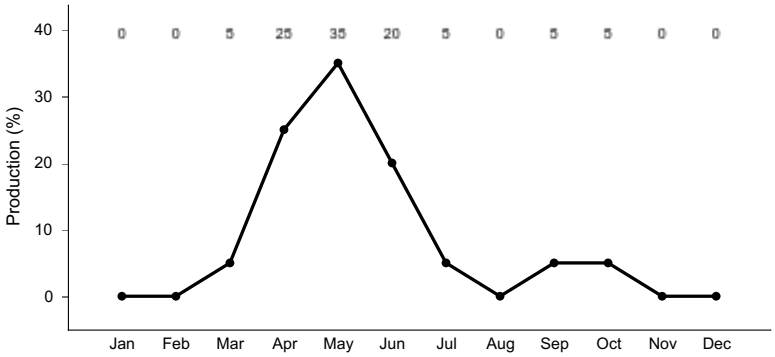


Figure 4. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Community 1.3
Phase 1.3 - Low Sagebrush / Sandberg Bluegrass Remnants of Bluebunch wheatgrass - Bottlebrush squirreltail - Thurber's needlegrass.

Phase 1.3 - Low Sagebrush / Sandberg Bluegrass Remnants of Bluebunch wheatgrass - Bottlebrush squirreltail - Thurber's needlegrass. This plant community is dominated by low sagebrush with Sandberg bluegrass in the understory. Bluebunch wheatgrass and other deep-rooted perennial bunchgrasses are present but in reduced amounts and in low vigor. This phase has developed due to improper grazing management and no fire.

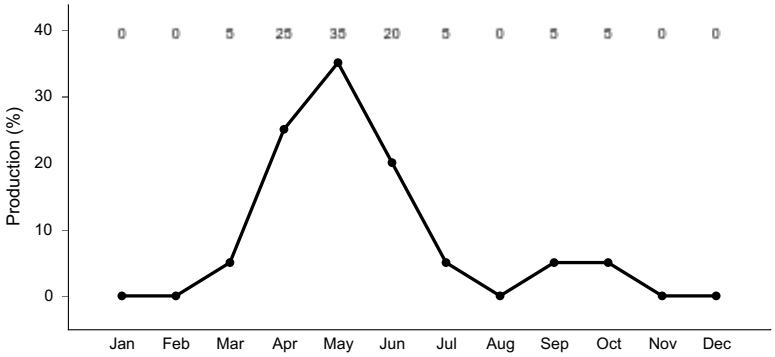


Figure 5. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Pathway 1.1A
Community 1.1 to 1.2

Phase 1.1 to 1.2. Develops with fire. Fire only occurs every 80 to 100 years in years with above normal precipitation.

Pathway 1.1B
Community 1.1 to 1.3

Phase 1.1 to 1.3. Develops under improper grazing management and no fire.

Pathway 1.2A
Community 1.2 to 1.1

Phase 1.2 to 1.1. Develops under a prescribed grazing management program and no fire.

Pathway 1.3A
Community 1.3 to 1.1

Phase 1.3 to 1.1. Develops from prescribed grazing management and no fire.

Pathway 1.3B
Community 1.3 to 1.2

Phase 1.3 to 1.2. Develops with fire.

State 2
Disturbed State

Dominant plant species

- Sandberg bluegrass (*Poa secunda*), grass
- cheatgrass (*Bromus tectorum*), grass
- medusahead (*Taeniatherum caput-medusae*), grass

Community 2.1
Phase 2.1 - Sandberg Bluegrass - Cheatgrass - Medusahead - Forbs

Sandberg Bluegrass - Cheatgrass - Medusahead - Forbs This plant community is dominated by Sandberg bluegrass, cheatgrass, medusahead, and a variety of forbs. Some perennial forbs are present. The community has developed due to continued improper grazing management and/or frequent fire. Some soil loss has occurred. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

Resilience management. State 2 to Unknown Site. Excessive soil loss and changes in the hydrologic cycle

caused by continued improper grazing management and fire causes this state to cross a threshold and retrogress to a new site with reduced potential.

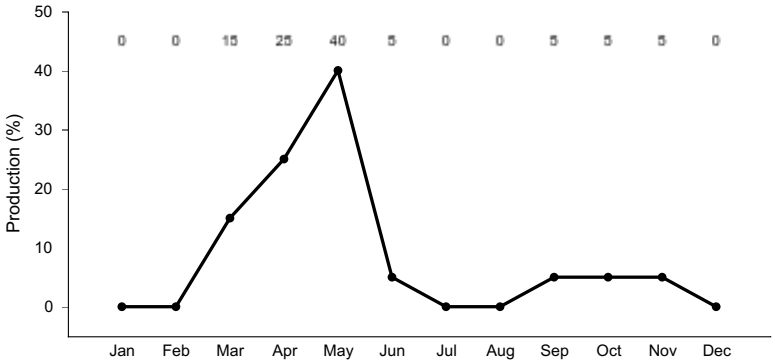


Figure 6. Plant community growth curve (percent production by month). ID0311, POSE/BRTE-ANNUALS . State 2.

Transition T1A
State 1 to 2

State 1, Phase 1.2 to State 2. Results from continued improper grazing management and/or frequent fire.

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 the reference plant community is dominated by mule deer, pronghorn antelope, and elk. The site provides important seasonal habitat 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. A change in the quality of the plant community over time can reduce the number and diversity of wildlife species in the area. Shrub obligate avian and mammal species may become rare and include sage-grouse, brewer's sparrow, sage thrasher and pygmy rabbits. Encroachment of noxious and invasive plant species (i.e. cheatgrass, medusahead and bulbous bluegrass) in isolated areas can replace native plant species which provide critical feed, brood-rearing and nesting cover for a variety of native wildlife. The loss of herbaceous understory vegetation has a negative impact on ground nesting birds, while the loss of shrub cover negatively affects both ground and shrub nesting avians. Water features are sparse provided by seasonal streams and artificial water catchments. The rangeland ecological site is interspersed with pre-historic lava flows which provide unique cave habitats for several sensitive animal species, including the Blind Cave Leiodid Beetle, Cave Obligate Mite, Bats and Cave Obligate Harvestman.

State 1 Phase 1.1 – Low Sagebrush/ Bluebunch Wheatgrass/ Green Rabbitbrush 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, boreal chorus frog 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. Native shrub-steppe obligate avian species utilizing the habitat include the Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Critical habitat (winter cover and winter food) for sage-grouse is provided by this diverse plant community. The plant community provides seasonal forage needs for large mammals (mule deer, antelope, and elk). A diverse small mammal population including golden-mantled ground squirrels, chipmunks and yellow-bellied marmots utilize this plant community.

State 1 Phase 1.2- Bluebunch Wheatgrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail 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 but a diverse native forb plant community would still support select pollinators. Cave dwelling insects and mammals from adjacent habitats would be supported by this plant community. Diversity and populations of reptiles would be limited or excluded due to the loss of shrub cover and prey species. 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 cover is nearby. The site does not provide suitable winter cover and winter food for sage-grouse. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer, antelope, and elk) forage use would be seasonal and the site offers no thermal cover and young of year cover. Small mammal diversity would be reduced and the plant community would not provide suitable habitat for pygmy rabbits.

State 1 Phase 1.3 – Low 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 results in a sparse herbaceous understory. An increase in rabbitbrush may occur if present in the plant community leading to an increase in total brush canopy. The reduced herbaceous understory results in decreased diversity and populations of insects. The reptile community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink and western rattlesnake. The reduced diversity and populations of insects will reduce reptile diversity and populations. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Shrub-steppe avian obligate species include Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Critical habitat (winter cover and winter food) for sage-grouse is available but may be limited if rabbitbrush becomes dominant in the plant community. The plant community supports limited seasonal forage habitat for large mammals including mule deer, antelope, and elk. A small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pygmy rabbits utilize this plant community.

State 2 - Sandberg Bluegrass/ Cheatgrass/ Medusahead Plant Community:
This plant community is the result of continued improper grazing management and/or frequent fire. The plant community does not support a diverse insect community. The reduced forb and shrub component in the plant community would support a very limited population of pollinators. 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 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. 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 reduction of insect population and diversity would reduce suitability of this site for bats. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

Grazing Interpretations.

This site is suited for grazing by livestock in spring, early summer, and fall. Early spring grazing should be avoided due to prolonged wetness in the soil.
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

No data

Recreational uses

Colorful spring and early summer blooming forbs provide excellent opportunities for photography and nature study. Hunting opportunities for pronghorn antelope and sage grouse exist.

Wood products

None

Other products

None

Other information

Field Offices

Mountain Home, ID
Gooding, ID
Shoshone, ID
Rupert, ID
Arco, ID

Inventory data references

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

Type locality

Location 1: Gooding County, ID	
Township/Range/Section	T4S R13E S3

References

. Fire Effects Information System. http://www.fs.fed.us/database/feis/.

Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number “35”.

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USDA, NRCS.2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov.). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

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

Contributors

Dave Franzen and Jacy Gibbs

Approval

Kirt Walstad, 12/13/2023

Rangeland health reference sheet

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

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Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	03/28/2008
Approved by	Kirt Walstad
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 on slopes approaching 10 percent and immediately following a wildfire or high intensity storm. Rills are most likely to occur on soils with silt loam or clay loam surface texture

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2. **Presence of water flow patterns:** water-flow patterns can occur on this site. When they do occur they are short and disrupted by cool season grasses, shrubs and surface stones. They are not extensive.

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3. **Number and height of erosional pedestals or terracettes:** pedestals are common on the site especially where flow patterns are present and the surface soils have a high clay content. Terracettes do not occur.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** need data but is expected to range from 40-50 percent.

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

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6. **Extent of wind scoured, blowouts and/or depositional areas:** usually not present.

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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 4 to 6 but needs to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure ranges from _____ to _____. Soil organic matter (SOM) needs to be determined. The A or A1 horizon is typically _____ inches thick.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses, especially deep rooted perennials, slow runoff and increase infiltration. Surface stones aid in slowing water movement and increasing infiltration. Medium height shrubs accumulate some 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):** not present. The site can develop a compaction layer due to the clay in the subsoil from severe livestock use when the soils are wet. Do not mistake an increase in clay content in the subsoil as a compaction layer.

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: medium shrubs

    Other: perennial forbs

    Additional: shallow rooted bunchgrasses

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 perennial grasses may occur due to extended periods of drought.

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

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 500 pounds per acre (560 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 35-50 percent of the total production, forbs 15-20 percent, and shrubs 35-45 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: includes cheatgrass, medusahead, Vulpia species, bulbous bluegrass, annual mustards, and rush skeletonweed.

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