USDA Natural Resources Conservation Service

Ecological site R010XA024ID
Stony Windswept Ridge 8-16 PZ

Last updated: 12/13/2023
Accessed: 05/10/2025

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

Ecological site concept

• Site occurs on uplands
• Slopes 10-40% on south or west aspects
• Occurs in 8-16 inch PZ
• Soils are not volcanic cinders
• Soils less than 20” to bedrock
• Site occurs on exposed ridgetops

Associated sites

R010XA004ID	**Loamy 12-16 PZ ARTRV/FEID-PSSPS** Adjacent low slope areas on all aspects
R010XA009ID	**South Slope Gravelly 12-16 PZ** Adjacent south slopes
R010XA037ID	**Shrubby Stony North 12-16 PZ ARTRV/FEID** Adjacent north slopes

Similar sites

R010XA007ID	**Shallow Stony Loam 8-16 PZ** Site not associated with windswept ridgetops, generally occupying flatter slopes
R010XA021ID	**South Slope Fractured 12-16 PZ** Site not associated with windswept ridgetops
R010XA001ID	**Clayey 12-16 PZ ARARL/FEID** Site not associated with windswept ridgetops, deeper soils

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia nova*
Herbaceous	(1) *Poa secunda*

Physiographic features

This site occurs on gentle to very steep wind exposed mountain ridges and tops predominantly on west and south exposures. Slopes vary from 10 to 60 percent. Elevations range from 4800-7000 feet (1450-2150 meters). This site usually occurs as long bands on ridgetops or on the windward side just off ridgetops.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain (2) Mountains > Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	4,800–7,000 ft
Slope	10–60%
Water table depth	80 in
Aspect	W, S

Climatic features

The Big and Little Wood River Foot slopes and Plains, proposed as MLRA 10A, 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. Drier areas in the MLRA do not have climate stations present, but drier areas do occur. 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)	16 in

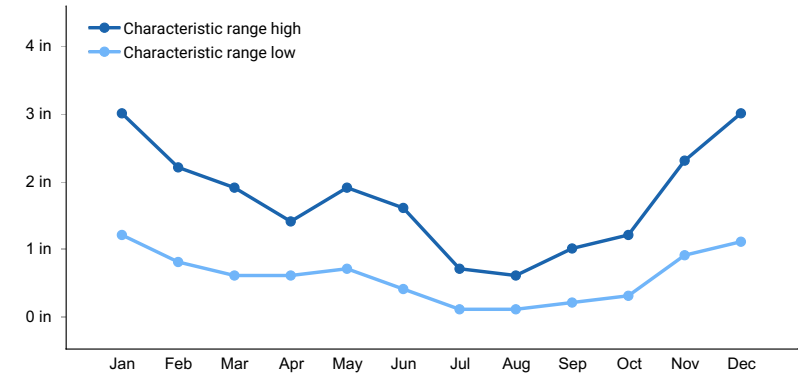


Figure 1. Monthly precipitation range

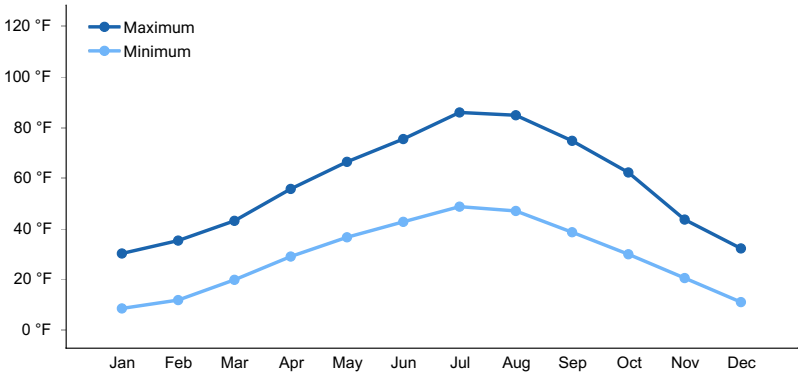


Figure 2. Monthly average minimum and maximum temperature

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

The soils on this site are generally shallow (less than 20 inches) to a fractured bedrock of limestone parent material. They have medium to moderately fine surface textures, mostly very fine sandy loams to silt loams. Coarse fragments in the profile may be common above the bedrock. Internal water movement is rapid. The available water holding capacity (AWC) is generally low. Some cracks in the bedrock may store some water for deep rooted plants. Erosion hazard is generally low.

Table 4. Representative soil features

Parent material	(1) Colluvium–limestone (2) Residuum–limestone
Surface texture	(1) Very fine sandy loam (2) Silt loam
Family particle size	(1) Loamy

Soil depth	0–20 in
Surface fragment cover <=3"	0–30%
Surface fragment cover >3"	0–30%

Ecological dynamics

The dominant visual aspect of this site is of sparse low growing vegetation. Plant composition by weight is approximately 20-40 percent grasses, 20-30 percent forbs, and 30-45 percent shrubs.

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 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 use by sheep and wildlife. It produces a low to medium quality of forage for livestock. Due to removal of snow by wind, the site offers winter forage for upland game birds and big game. The site offers little recreational or aesthetic value.

Due to the surface stones on this site, it is fairly resistant to disturbances that can potentially degrade it. The site does, however, have high runoff potential.

Impacts on the Plant Community.

Influence of fire:

This site historically had a very low fire frequency, approximately every 80-100 years. Most of the shrubs evolved in the absence of fire, therefore they can be severely damaged when burned. Cheatgrass can be a troublesome invader at lower elevations on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency.

Influence of improper grazing management:

Black sagebrush can be impacted by improper grazing management. Relatively low levels of utilization by cattle and sheep are needed to maintain the shrub component.

Proper grazing management will help maintain the integrity of the plant community.

Weather influences:

Sandberg bluegrass has the ability to withstand short-term drought by becoming dormant during an abnormally dry spring. However, extended periods of drought impact this site due to the low water holding capacity and shallow soil. Extended drought reduces vigor of the perennial grasses and palatable shrubs. Extreme drought may cause plant mortality.

Influence of insects and disease:

An outbreak of a particular insect or disease 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 can be an invasive species on this site, especially after fire. Once it becomes 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. Sage grouse may use the site during the winter. Winter and spring use by mule deer occasionally occurs.

Watershed:

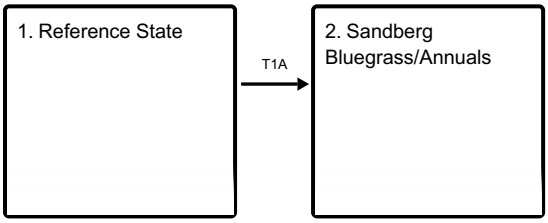
Decreased infiltration and increased runoff occurs when black sagebrush is removed with frequent fires, particularly the year following the fire event. The increased runoff also increases sheet and rill erosion. The long-term effect is a transition to a different state. This site has a low erosion hazard but a high run-off potential.

Practice Limitations.

Due to the stony soils, harsh climate and high run-off potential, severe limitations exist for range seeding on this site. Severe limitations exist for brush management with ground moving equipment due to stoniness. Low potential production and wildlife values must be considered if planning brush management.

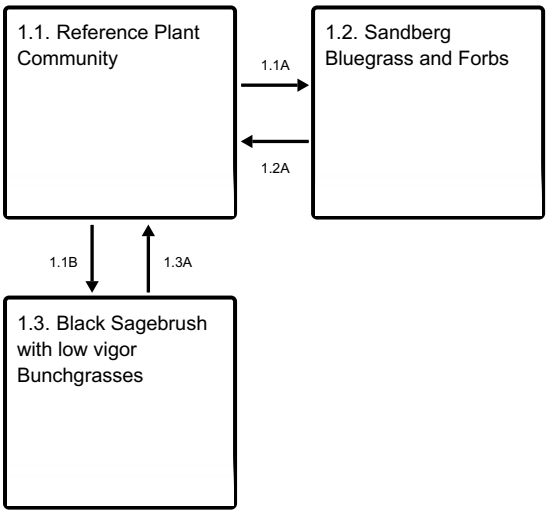
State and transition model

Ecosystem states



T1A - improving grazing management, fire

State 1 submodel, plant communities



1.1A - fire

1.1B - improper grazing management and no fire

1.2A - prescribed grazing and no fire

1.3A - prescribed grazing management, no fire

State 2 submodel, plant communities

2.1. Sandberg Bluegrass

State 1
Reference State

Community 1.1
Reference Plant Community

1.1 Black Sagebrush - Sandberg Bluegrass - Bottlebrush Squirreltail This plant community is dominated by Sandberg bluegrass and black sagebrush. Bottlebrush squirreltail is subdominant. Small amounts of Indian ricegrass and Nevada bluegrass may be present. A large variety of forbs are present but each represents a small amount in the community. Other shrubs such as antelope bitterbrush, green and rubber rabbitbrush, and gray horsebrush can be present in small amounts. Root-sprouting shrubs such as rabbitbrush and horsebrush will be most prevalent after fire. The natural fire frequency is about 80-100 years.

Resilience management. The Reference Plant Community Phase is Phase 1.1. This plant community is dominated by black sagebrush in the overstory and Sandberg bluegrass in the understory. The plant species composition of Phase 1.1 is listed later under “Reference Plant Community Phase Plant Species Composition”. Total annual production is 350 pounds per acre (392 Kg/ha) in a normal year. Production in a favorable year is 500 pounds per acre (560 Kg/ha). Production in an unfavorable year is 200 pounds per acre (224 Kg/ha). Structurally low growing shrubs are very dominant, followed by shallow rooted bunchgrasses being nearly co-dominant with perennial forbs.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	90	165	225
Grass/Grasslike	60	100	150
Forb	50	85	125
Total	**200**	**350**	**500**

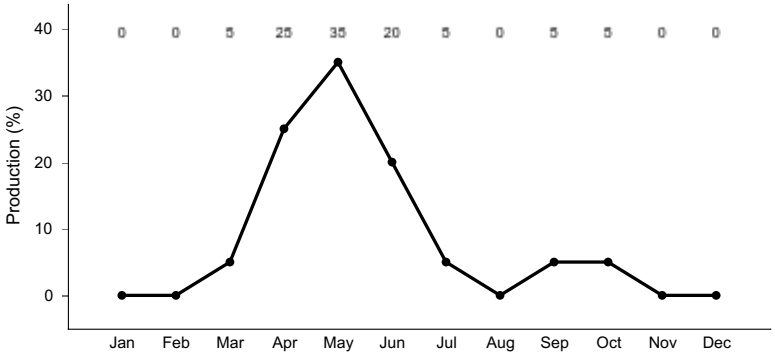


Figure 4. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Community 1.2
Sandberg Bluegrass and Forbs

1.2 Sandberg Bluegrass - Forbs with Increase in Grey Horsebrush and Rabbitbrush This plant community is dominated by Sandberg bluegrass and a large variety of forbs. Grey horsebrush and green and gray rabbitbrush have re-sprouted from the roots. Some annual grasses have invaded. This phase has developed due to fire.

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	65-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

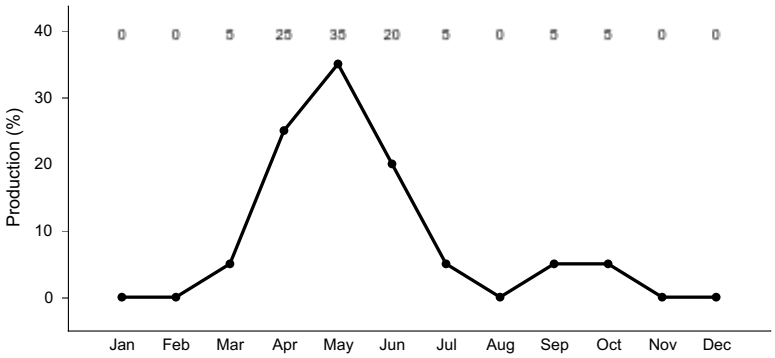


Figure 5. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Community 1.3
Black Sagebrush with low vigor Bunchgrasses

1.3 Black Sagebrush - Sandberg Bluegrass - Declining vigor This plant community is dominated by black sagebrush with Sandberg bluegrass in the understory. Deep-rooted perennial bunchgrasses such as bottlebrush squirreltail, bluebunch wheatgrass and Indian ricegrass are present but in reduced amounts and in low vigor. Some annual grasses have invaded. Forbs are declining. This phase has developed due to improper grazing management and no fire.

Table 7. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%

Litter	65-80%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

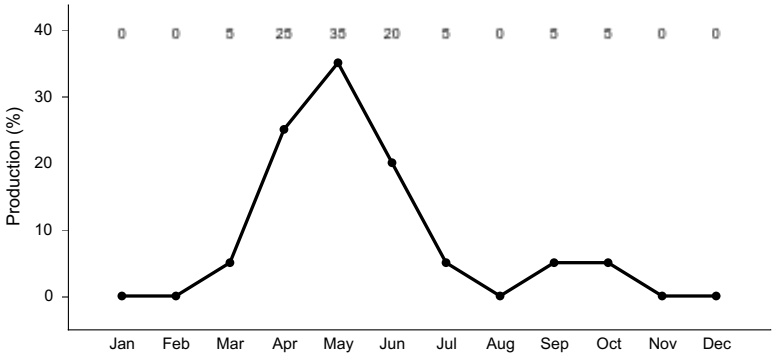


Figure 6. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Pathway 1.1A
Community 1.1 to 1.2

Phase 1.1 to 1.2. Develops with fire (approximately every 80-100 years). Fire only occurs in above normal precipitation (favorable) years.

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 from prescribed grazing and no fire.

Pathway 1.3A
Community 1.3 to 1.1

Phase 1.3 to 1.1. Develops under a prescribed grazing management program and no fire.

State 2
Sandberg Bluegrass/Annuals

Resilience management. State 2 to Unknown Site. The site has deteriorated further and soil loss has occurred resulting in a loss of site potential. This has resulted from improper grazing management and/or fires. The site has crossed the threshold and it is not economical to return this site to State 1 with accelerating practices.

Community 2.1
Sandberg Bluegrass

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 fire from Phase 1.3, State 1 and with frequent fire from Phase 1.2, State 1. Some soil loss has occurred. The site

has crossed the threshold and it is not economical to return this site to State 1 with accelerating practices.

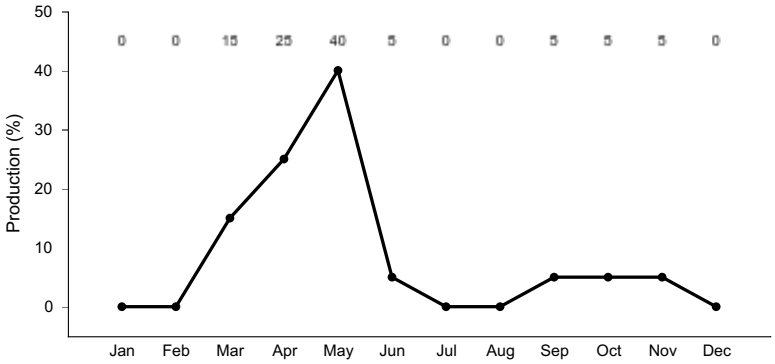


Figure 7. Plant community growth curve (percent production by month). ID0311, POSE/BRTE-ANNUALS . State 2.

Transition T1A
State 1 to 2

State 1 to State 2. Develops with frequent fire from Phase 1.2 or with improper grazing management and fire from Phase 1.3. The site has crossed the threshold and is not economical to return this site to State 1 with accelerating practices.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				60–150	
	Sandberg bluegrass	POSE	*Poa secunda*	45–115	–
	squirreltail	ELEL5	*Elymus elymoides*	10–25	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	1–15	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	1–10	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–5	–
Forb					
2				50–125	
	spiny phlox	PHHO	*Phlox hoodii*	15–40	–
	wormleaf stonecrop	SEST2	*Sedum stenopetalum*	10–20	–
	buckwheat	ERIOG	*Eriogonum*	10–20	–
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	5–15	–
	rosy pussytoes	ANRO2	*Antennaria rosea*	0–10	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	1–10	–
	fleabane	ERIGE2	*Erigeron*	1–10	–
	stemless mock goldenweed	STAC	*Stenotus acaulis*	0–5	–
	deathcamas	ZIGAD	*Zigadenus*	0–5	–
	little larkspur	DEBI	*Delphinium bicolor*	0–5	–
	owl's-clover	ORTHO	*Orthocarpus*	0–5	–
	low beardtongue	PEHU	*Penstemon humilis*	0–5	–
	rockcress	ARABI2	*Arabis*	0–5	–
	sandwort	ARENA	*Arenaria*	1–5	–
	castilla	CASTI	*Castilla*	0–5	–
	Douglas' dustymaiden	CHDO	*Chaenactis douglasii*	0–5	–
Shrub/Vine					
3				90–225	
	black sagebrush	ARNO4	*Artemisia nova*	65–165	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	1–5	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	1–5	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	1–5	–
	spineless horsebrush	TECA2	*Tetradymia canescens*	1–5	–

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides habitat for select native wildlife species who can tolerate cold windy sites high in elevation with a sparse plant community. The plant community exhibits a diverse mixture of forbs throughout the short growing season offering excellent habitat for invertebrates. Wildlife uses these areas on a seasonal basis due to the high elevation, short growing season and temperature regimes. Mule deer and antelope are the large herbivores using the site. The site provides seasonal habitat for resident and migratory animals including western toad, sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark and western meadowlark. Sage-grouse, an area sensitive species, may utilize the plant

community for nesting, winter cover and winter food. Encroachment of noxious and invasive plant species (cheatgrass) in isolated areas can replace native plant species which provide critical 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 –Black Sagebrush/ Sandberg Bluegrass/ Bottlebrush Squirreltail Reference Plant Community (RPC) This plant community provides a diversity of grasses, forbs and shrubs, used throughout the growing season by native insect communities that assist in pollination. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western toad, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Sage-grouse may utilize this plant community for nesting, winter food and cover. The plant community provides forage for large mammals including mule deer and antelope. A diverse small mammal population including golden-mantled ground squirrels, chipmunks and yellow-bellied marmots utilize this community. Antelope bitterbrush can be associated with this site. The deer mouse is the principal vector for planting bitterbrush seed.

State 1 Phase 1.2 –Sandberg Bluegrass/ Forbs Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. Patches of root sprouting shrubs (rabbitbrushes) may be present and provide limited vertical structure for wildlife. Insect diversity would be reduced due to less shrub cover but a native forb plant community would still support select pollinators. The reptiles including short horned lizard and sagebrush lizard would be limited or excluded due to the loss of sagebrush. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collected all available water would exclude the use of amphibians on these sites. Winter cover and winter forage use by sage-grouse is eliminated. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer and antelope) use for forage would be limited to herbaceous vegetation in the spring and fall. The diversity and populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

State 1 Phase 1.3- Black 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. The reduced herbaceous understory results in reduced diversity and numbers of insects. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink and western toad. The reduction of grasses and forbs in the plant community would reduce the available prey species and cover for these resident reptiles. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collected all available water would exclude the use of amphibians on these sites. Fewer prey species and sparse understory cover results in limited food, brood-rearing and nesting habitat for avians. Winter cover and winter food for sage-grouse is available. Reduced understory vegetation and increased sagebrush density reduces forage value for large mammals including mule deer, and antelope. A small mammal population including golden-mantled ground squirrels, chipmunks and yellow-bellied marmots would utilize these areas.

State 2 – Sandberg Bluegrass/ Cheatgrass / Medusahead Plant Community:
This plant community is the result of continued improper grazing management and frequent fire. Invasive herbaceous plants and patches of root sprouting shrubs like rabbitbrushes can be present. The reduced forb and shrub component in the plant community would support a very limited population of pollinators. Most reptilian species are not supported with food, water or cover. This plant community does not support any 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. Large mammals may utilize the herbaceous vegetation in the early part of the year when the invasive annuals (cheatgrass) are more palatable. At other times of the year large mammals would not regularly utilize these areas due to poor food and cover conditions. The diversity and populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

Grazing Interpretations.

This site provides a low to medium quality forage for livestock. The site is best suited for use by sheep and wildlife. It is best suited for grazing by sheep in the summer with

some potential use by cattle in the fall.
estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use, and seasonal preference.

Hydrological functions

The soils on this site are in hydrologic group D. They have high run-off potential.

Recreational uses

This site offers little recreational or aesthetic value.

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: Blaine County, ID	
Township/Range/Section	T2S R19E S2
Location 2: Blaine County, ID	
Township/Range/Section	T2S R20E S7

References

. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136 Vols 1-3. USDA Forest Service, Rocky Mountain Research Station.

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”.

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

USDA, Forest Service, Fire Effects Information Database. 2004. www.fs.fed.us/database.

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.

Author(s)/participant(s)	Dave Franzen and Jacy Gibbs Intermountain Range Consultants 17700 Fargo Rd. Wilder, ID 83676
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 rarely occur on this site due to the stony surface soils.

---

2. **Presence of water flow patterns:** water-flow patterns rarely 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.

---

3. **Number and height of erosional pedestals or terracettes:** pedestals can occur on the site especially where flow patterns are present and on slopes greater than 20%. Do not mistake frost heave for pedestals. Terracettes would only occur on the uphill side of large bunchgrasses.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** it ranges from 20-35 percent.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** this site is naturally scoured by wind. Surface stones and vegetation protect the soil from additional wind erosion.

7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces typically moves up to three feet or further. Fine litter can be moved by both wind and water. 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.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** No data

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** bunchgrasses and shrubs slow runoff and increase infiltration. Little to no snow accumulation occurs on the site due to winter winds.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** not present. Do not mistake an increase in clay content of the subsoil for 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: low growing shrubs

    Sub-dominant: shallow rooted bunchgrasses

    Other: perennial forbs

    Additional: cool season shallow rooted perennial 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 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 350 pounds per acre (392 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 20-40 percent of the total production, forbs 20-30 percent and shrubs 30-45 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 and bulbous bluegrass at lower elevations. Medusahead may invade the site when the surface soil has a high clay content.

---

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