

Ecological site R012XY006ID

Windswept

8-16 PZ ARFR4/POSE

Last updated: 9/21/2020
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General information

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

MLRA notes

Major Land Resource Area (MLRA): 012X—Lost River Valleys and Mountains

Land Resource Region: B (Northwestern Wheat and Range) MLRA: 12 (Lost River Valleys and Mountains) EPA EcoRegion: Level III (Middle Rockies)

LRU notes

012X—Lost River Valleys and Mountains Precipitation or Climate Zone: 8-16" P.Z. <https://soils.usda.gov/survey/geography/mlra/index.html>

Ecological site concept

Site does not receive additional water. Soils are: On ridgetops and mountain slopes Not saline or saline-sodic. Moderately deep to very deep. >35% (by volume) coarse fragments, skeletal within 20" of soil surface. strongly or violently effervescent in the to 20" of the soil profile. textures usually range from sandy loam to loam in surface mineral 4". Slope is 30%. Clay content is = 35% in surface mineral 4". Site does not have an argillic horizon with > 35% clay.

Associated sites

R012XY001ID	Limy Gravelly 8-13 PZ ARNO4/PSSPS
R012XY007ID	Shallow Gravelly Loam 8-12 PZ ARAR8/PSSPS-ACHY
R012XY017ID	Shallow Fractured South 8-12 PZ ARTRW8/PSSPS-LESAS2
R012XY026ID	Dry Loamy 7-10 PZ ATCO-ARFR4/PSSPS
R012XY030ID	Loamy 7-10 PZ ARTRW8/POSE

Table 1. Dominant plant species

Tree	Not specified
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Shrub	(1) <i>Artemisia frigida</i>
Herbaceous	(1) <i>Poa secunda</i>

Physiographic features

This site occurs on alluvial and colluvial fans, terraces, ridgetops and mountain slopes. It usually occupies the windswept portion of the ridgetop or mountain slope. Elevation ranges from 5400 to 8500 feet (1650-2600 meters) and it occurs on all aspects.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Terrace (3) Ridge
Elevation	1,650 – 2,590 m
Slope	0 – 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)	100 days
Freeze-free period (average)	140 days
Precipitation total (average)	230 mm

Influencing water features

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

Soil features

The soils of this site are predominately gravelly and very gravelly loams. Gravel exceeds 40 percent by volume in the B horizon. These soils are very deep with the exception of Paint which is shallow to a duripan. Gravels can exceed 60 percent by volume. The limiting

factors for this site are the extremely low moisture availability and the high wind stress. The soils are well to somewhat excessively drained and have slow to moderately rapid permeability. Available water capacity is very low to low. Water erosion can be high when the plant cover is reduced and slope increases. These soils are characterized by an aridic soil moisture regime or an aridic bordering on xeric. The soil temperature regime is either frigid or cryic.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Very gravelly
Drainage class	Well drained to somewhat excessively drained
Permeability class	Slow to moderately rapid
Soil depth	30 – 150 cm
Surface fragment cover ≤3"	20 – 40 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	2.79 – 12.95 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 30 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 10
Subsurface fragment volume ≤3" (Depth not specified)	30 – 80 %

Subsurface fragment volume >3" (Depth not specified)	0 – 20 %
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Ecological dynamics

The dominant visual aspect of this site is low growing vegetation and it can be sparse and barren at times. Composition by weight is approximately 30-40 percent grasses, 25-35 percent forbs and 30-40 percent shrubs. The plant community is dominated by fringed sagewort in the overstory and Sandberg bluegrass in the understory. Subdominant species include Hoods phlox and stemless goldenweed.

Herbivory has historically occurred on the site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, bighorn sheep, Rocky Mountain elk, 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.

Total annual production is 200 pounds per acre (222 Kg/ha) in a normal year. Production in a favorable year is 350 pounds per acre (388 Kg/ha). Production in an unfavorable year is 100 pounds per acre (111 Kg/ha). Structurally, low growing shrubs and perennial grasses are co-dominant followed by perennial forbs.

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. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

FUNCTION

This site is not a high value site for livestock grazing due to the low production. High quality forage is available only for a short time in the spring.

Mule deer and bighorn sheep use the site seasonally. Pronghorn antelope use the site yearlong. Sage grouse frequently winter on this site because of its snow-free characteristic. Pronghorn antelope hunting occurs on this site primarily as it is associated with surrounding sites.

Probably the major recreation value of this site is that it provides unobstructed observation points for viewing the natural beauty of the surrounding area.

Due to the gravelly surface soils this site is not easily degraded by improper grazing management or frequent fires.

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 and therefore can be severely damaged or killed 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

Bud sagebrush, shadscale saltbush, black sagebrush and winterfat, when they occur on the site, can be impacted by improper grazing management. Abnormally high numbers of pronghorn antelope may negatively impact chicken sage.

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. 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.

Shadscale saltbush can be heavily impacted by the scale insect, *Orthezia annae*, also called "mealy bug". This insect is moved by ants from one plant to another and feeds on the roots of shadscale saltbush. It can cause stand mortality, especially following a series of drought years.

Influence of noxious and invasive weeds

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 invasive on this site, especially after fire at lower elevations. 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 and mule deer are the dominant large herbivores using the site. They use the site yearlong but prefer it in the spring, fall and early winter. It is an important wintering area for sage grouse since the wind keeps the ridgetops blown free of snow, making the vegetation accessible.

Watershed

Decreased infiltration and increased runoff occurs when the shrubs are 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. (The last statement is thought to be technically accurate).

Plant Community and Sequence

Transition pathways between common vegetation states and phases:

State 1.

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

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

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

Phase C to A. Develops under a prescribed grazing management program and no fire.

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

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

Practice Limitations

Due to the gravelly soils and harsh climate, severe limitations exist for range seeding on this site. Brush management is not needed or useful on this site.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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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 production on the site is low with a mixture of forbs, grasses, and sub-shrubs throughout the short growing season offering habitat for invertebrates. Mule deer,

bighorn sheep, and pronghorn antelope are the large herbivores using the site. The site provides seasonal habitat for resident and migratory animals including ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, and prairie falcon. Sage-grouse, an area sensitive species, may utilize the plant community for winter food. Water features are sparse provided by artificial water catchments and springs adjacent to the site. State 1 Phase 1.1 – Fringed Sagewort/ Sandberg Bluegrass/ Needle and Thread/ Bottlebrush Squirreltail Reference Plant Community (RPC) This plant community provides grasses, forbs, and sub-shrubs used throughout the growing season by native insect communities that assist in pollination. The reptile community is limited due to poor cover and represented by leopard lizard, short horned lizard, and sagebrush lizard. Sage-grouse utilize this plant community for winter food. The plant community provides forage for large mammals including mule deer and antelope in the spring, fall, and early winter. A limited small mammal population would include ground squirrels, and chipmunks. State 1 Phase 1.2 – Sandberg Bluegrass/ Forbs Plant/ Rubber Rabbitbrush and Gray Horsebrush Community: This plant community is the result of fire. Patches of root sprouting shrubs (rabbitbrushes, horsebrush) may be present and provide limited vertical structure for wildlife. Until the shrub community re-establishes insect diversity would be reduced due to less shrub cover. A native forb plant community similar to Phase 1.1 would persist and support select pollinators. Habitat quality for reptiles may increase over time with the increase in rabbitbrush and horsebrush. Winter forage use by sage-grouse is eliminated. Large mammal (mule deer and pronghorn) use for forage would be limited to herbaceous vegetation in the spring and fall. State 1 Phase 1.3- Fringed Sagewort/ Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and no fire. The invertebrate community would be similar to Phase 1.1. The reptile community is represented by leopard lizard, short horned lizard and sagebrush lizard. Winter food for sage-grouse is available. Forage value for large mammals including mule deer, and pronghorn in spring and fall would be reduced. The small mammal population would be similar to Phase 1.1. State 2 – Sandberg Bluegrass/ Cheatgrass Plant Community: This plant community is the result of continued improper grazing management and frequent fire. The reduced forb and shrub components 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. 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. Grazing Interpretations This site is not a high value site for livestock grazing due to the low production. High quality forage is available only for a short time in the spring. 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.

Recreational uses

Probably the major recreation value of this site is that it provides unobstructed observation points for viewing the natural beauty of the surrounding area.

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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Approval

Kendra Moseley, 9/21/2020

Rangeland health reference sheet

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

Author(s)/participant(s)	
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Date	02/05/2008
Approved by	
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 gravelly 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:** Erosional pedestals or terracettes are rare but can occur on the site, especially where flow patterns are present and on slopes greater than 20%.

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

5. Number of gullies and erosion associated with gullies: Gullies do 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 3-5 but need to be tested.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Structure ranges from weak very fine and fine granular to weak or moderate thin and medium platy to weak very fine and fine subangular blocky. The A or A1 horizon is typically 2 to 9 inches thick. Soil organic matter (SOM) ranges from 0.5 to 7 percent.

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): Compaction layer is 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= perennial bunchgrasses>

Sub-dominant: Perennial forbs

Other:

Additional:

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 200 pounds per acre (222 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 30-40 percent of the total production, forbs 25-35 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, annual mustards and halogeton.
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17. Perennial plant reproductive capability: All functional groups have the potential to reproduce in normal and favorable years.
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