

Ecological site R012XY026ID

Dry Loamy

7-10 PZ ATCO-ARFR4/PSSPS

Last updated: 9/22/2020
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General information

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

MLRA notes

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

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

LRU notes

012X—Lost River Valleys and Mountains Precipitation or Climate Zone: 7-10" P.Z. <https://soils.usda.gov/survey/geography/mlra/index.html>

Ecological site concept

Site does not receive additional water. Soils are: Not saline or saline-sodic. Moderately deep to fractured bedrock, 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 loam to silt 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

R012XY004ID	Gravelly Loam 8-12 PZ ARTRW8/PSSPS
R012XY009ID	Saline Gravelly 7-9 PZ ATCO/ACHY-HECOC8
R012XY017ID	Shallow Fractured South 8-12 PZ ARTRW8/PSSPS-LESAS2
R012XY030ID	Loamy 7-10 PZ ARTRW8/POSE

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex confertifolia</i> (2) <i>Artemisia frigida</i>

Herbaceous	(1) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>
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Physiographic features

This site occurs on gently to steeply sloping foothills and low mountains. Elevation ranges from 5000-6600 feet (1500-2000 meters). Slopes vary from 5 to 40 percent but are generally less than 25 percent.

Table 2. Representative physiographic features

Landforms	(1) Mountain
Elevation	1,520 – 2,010 m
Slope	10 – 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)	110 days
Freeze-free period (average)	140 days
Precipitation total (average)	280 mm

Influencing water features

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

Soil features

The soils on this site are well drained loams. Holinrock is moderately deep to fractured bedrock, while Goldaho is shallow to a heavy clay layer. Some fine gravels may be present in the soil profile. Goldaho is impermeable due to the high clay content and Holinrock has a moderate permeability. Available water capacity is very low to low. These soils have an aridic soil moisture regime, or aridic bordering on xeric. The soil temperature regime is frigid.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam
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Drainage class	Well drained
Permeability class	Moderate
Soil depth	50 – 150 cm
Surface fragment cover <=3"	30 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	5.84 – 13.46 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 20 %
Electrical conductivity (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	20 – 50 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

The dominant visual aspect of the site is shadscale saltbush in the overstory with bluebunch wheatgrass and needle and thread in the understory. The composition by weight is 65-75 percent grasses, 10-20 percent forbs, and 10-20 percent shrubs.

During the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer, pronghorn antelope, lagomorphs and small rodents. Fire has historically occurred on the site at intervals of 80-100 years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by bluebunch wheatgrass and needle and thread in the understory and shadscale saltbush in the overstory. Subdominant species include bottlebrush squirreltail, Sandberg bluegrass, Indian ricegrass and fringed sagewort. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species

Composition".

Total annual production is 350 pounds per acre (392 kilograms per hectare) in a normal year. Production in a favorable year is 500 pounds per acre (560 kilograms per hectare). Production in an unfavorable year is 150 pounds per acre (168 kilograms per hectare). Structurally, cool season perennial bunchgrasses are dominant, followed by medium shrubs being about equal to perennial forbs.

FUNCTION:

This site is suited for grazing by domestic livestock in the spring, early summer and fall. It provides fair habitat for various upland wildlife including pronghorn antelope.

The soils on this site are in hydrologic group B. When the hydrologic condition of the vegetative cover is good, natural erosion hazard is slight.

This site has fair recreation and natural beauty values due to the lack of variability of the landscape and the plants growing on it.

Due to the ease of access and lack of large stones on the surface, this site is easily degraded by improper grazing management or frequent fires.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, shadscale saltbush and fringed sagewort can gradually increase on the site. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, these shrubs can displace many of the primary understory species.

When fires become more frequent than historic levels (80-100 years), shadscale saltbush, bud sagebrush, winterfat and Wyoming big sagebrush are reduced significantly. Fringed sagewort will generally re-sprout after fire. Green rabbitbrush can increase slightly. With continued short fire frequency, these shrubs can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass, needle and thread, and Indian ricegrass. Sandberg bluegrass will increase along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass and/or medusahead will invade the site. These fine fuels will increase the fire frequency.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. This type of management leads to reduced vigor of the bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in fringed sagewort, prickly pear, Wyoming big sagebrush, green rabbitbrush and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels. As cheatgrass and/or medusahead increases and becomes co-dominant with Sandberg bluegrass and other annuals, fires more become frequent.

Proper grazing management that addresses frequency, duration, and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in fringed sagewort, prickly pear, Wyoming big sagebrush and green rabbitbrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management on this specific site should be very carefully planned, as a reduction in shrubs without a suitable understory of perennial grasses, can increase cheatgrass and/or medusahead which can lead to more frequent fire intervals and the loss of valuable wildlife habitat. If shadscale saltbush, bud sagebrush, and winterfat are the primary shrub species occupying the site, prescribed burning is not an appropriate practice.

Weather influences:

Above normal precipitation in April, May and June can dramatically increase total annual production of the plant community. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Likewise, below normal precipitation during these spring months can significantly reduce total annual production and be detrimental to viable seed production. Overall plant composition is normally not affected when perennials have good vigor.

Below normal temperatures in the spring can have an adverse impact on total production regardless of the precipitation. An early, hard freeze can occasionally kill some plants. Prolonged drought adversely affects this plant community in several ways. Vigor, recruitment and production are usually reduced. Mortality can occur. Prolonged drought can lead to a reduction in fire frequency.

Influence of insects and disease:

Mormon crickets and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

Shadscale saltbush can be heavily impacted by the scale insect, *Orthezia annae*. It is 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 plants:
Many of these species add to the fine-fuel component and lead to increased fire frequency. Perennial and annual invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:
Big game animals use this site in all seasons. Their numbers are seldom high enough to adversely affect the plant community. Burrowing rodents can create microsites for establishment of noxious and invasive plant species.

Watershed:
Decreased infiltration and increased runoff occur with an increase in fringed sagewort, prickly pear, Wyoming big sagebrush and green rabbitbrush. Desired understory species can be reduced. This composition change can affect nutrient and water cycles. Increased runoff also causes sheet and rill erosion. Abnormally short fire frequency also gives the same results, but to a lesser degree. The long-term effect is a transition to a different state.

Plant Community and Sequence:
Transition pathways between common vegetation states and phases:

State 1.
Phase A to B. Develops with improper grazing management and in the absence of fire.
Phase A to C. Develops with fire.
Phase B to A. Develops with prescribed grazing and no fire.
Phase C to A. Develops with prescribed grazing and no fire.

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

State 2 to 3. Results from range seeding.

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

Practice Limitations.
Slight limitations exist on this site for implementing vegetative management and facilitating practices. Moderate to severe limitations exist for implementing accelerating practices. Low annual precipitation makes it necessary that certain precautions be followed when planning a range seeding. The site contains significant amounts of shrubs that are important to wildlife.

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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Table 10. Community 6.1 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 The rangeland ecological site provides a sparse but diverse plant community for select native wildlife species. Mule deer and pronghorn antelope are the large herbivores using the site. It provides seasonal habitat for resident and migratory animals including sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Encroachment of noxious and invasive plant species (cheatgrass and Russian thistle) in isolated areas can replace native plant species which provide feed, brood-rearing, and nesting cover for a variety of native wildlife. Water features are sparse provided by seasonal runoff, artificial water catchments, and springs. State 1 Phase 1.1 – Shadscale Saltbush/ Bluebunch Wheatgrass/ Needle and Thread 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 community is represented by sagebrush lizard, leopard lizard, and short horned lizard. The plant community provides forage throughout the year for mule deer and pronghorn. Shadscale saltbush provides good spring and winter and is utilized extensively by rodents, rabbits, birds, and pronghorn. Small mammal populations include deer mice, jackrabbits, and Great Basin kangaroo rats who provide an excellent prey base for raptors. State 1 Phase 1.2 –Shadscale Saltbush/ Sandberg Bluegrass/ Bottlebrush Squirreltail/ Fringed Sagewort Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of brush 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, and sagebrush lizard. The reduced diversity of insects and understory cover may reduce the quality of food and cover for reptile populations. The site may provide sage-grouse brood-rearing habitat when adjacent to sagebrush cover. The plant community provides limited seasonal habitat for mule deer and pronghorn. A small mammal population including golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots may utilize this site State 1 Phase 1.3- Sandberg Bluegrass/ Fringed Sagewort / Bottlebrush Squirreltail 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 sub-shrubs (fringed sagewort) may begin to provide limited vertical structure for wildlife over time. Insect diversity would be reduced with the reduction of shadscale. Native forbs are still present and would support select pollinators. Reptiles, including short horned lizard and sagebrush lizard would be limited or excluded on sites with low brush cover. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). The loss of shadscale would prevent the use of the site for winter feed by mule deer and pronghorn. The populations of small mammals would be dominated by open grassland species. Hunting success by predators may increase due to the reduction of cover for small mammals. State 2 - Sandberg Bluegrass/ Cheatgrass / Annual Plant Community: This state has developed due to frequent fires and continued improper grazing management. 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. 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. Predator hunting success may increase due to poor cover provided for small mammals and grassland bird 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 populations of small mammals would be dominated by open grassland species. State 3 - 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 1.3. 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 antelope 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 the spring and early summer. 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

The soils on this site are in hydrologic group B. When hydrologic condition of the vegetative cover is good, natural erosion hazard is slight.

Recreational uses

This site provides fair recreation and natural beauty values due to the lack of variability of the landscape and the plants that grow on it.

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, 9/22/2020

Rangeland health reference sheet

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

Author(s)/participant(s)	
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Date	01/17/2008
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. If rills are present, they are most likely to occur after a hard rain for several continuous days, rain on frozen ground and immediately following wildfire.

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

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground data not available. On sites in mid-seral status, bare ground may range from 70-80 percent. **** 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:** Wind scoured, blowouts and/or depositional areas usually do not occur. Some wind erosion may occur immediately following a wildfire on soils that have fine textured surface soils.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move less than 2 feet following a significant run-off event. Coarse litter generally does not move.

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 to 5 but need to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A or A1 horizon is typically 1 to 6 inches thick. Structure ranges from weak thin platy to weak fine subangular blocky. Soil organic matter (SOM) ranges from 1 to 2 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses, especially deep-rooted, slow run-off and increase infiltration. Shrubs accumulate snow in the interspaces. Terracettes, when present, provide a favorable micro-site for vegetation establishment which further increases infiltration.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): Compaction layer is not present.
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12. Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):

Dominant: Cool season perennial bunchgrasses >>

Sub-dominant: Medium shrubs=perennial forbs

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Very little plant decadence is expected on this site. Some mortality will occur after extended periods of drought.
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14. Average percent litter cover (%) and depth (in): Annual litter cover in the interspaces will be 3-10 percent to a depth of <0.1. Under the mature shrubs, litter is greater than 0.5 inches.
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15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): Annual production is 350 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 65-75 percent of the total, forbs 10-20 percent and shrubs 10-20 percent.
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16. Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site: Invasive species include cheatgrass, halogeton, tansy mustard, rush skeletonweed, scotch thistle, spotted and diffuse knapweed.
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17. Perennial plant reproductive capability: All functional groups have the potential to reproduce in normal and favorable years.
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