

Ecological site R012XY003ID Saline Flat <8 PZ ATGA/ACHY

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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" P.Z.
<https://soils.usda.gov/survey/geography/mlra/index.html>

Ecological site concept

Site does not receive additional water.
Soils are:
Slight to moderate saline or saline-sodic.
Very deep. Not skeletal within 20" of soil surface.
Not strongly or violently effervescent throughout 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

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex gardneri</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i>

Physiographic features

This site occurs on level to gently sloping areas. Slopes range from 0-5 percent. Occasional overland flows deposit small amounts of alluvium. The site occurs on all aspects and elevation ranges from 4700-5800 feet (1440-1780 m).

Table 2. Representative physiographic features

Landforms	(1) Hill
Elevation	1,433–1,768 m
Slope	0–5%

Climatic features

MLRA 12 is dominated by dramatic changes in elevation which, in turn, influence local weather patterns. The intermontane valleys have elevations as low as 3800 feet, while the adjacent mountains may reach more than 12,600 feet. The average annual precipitation for the entire MLRA, based on 10 long term climate stations located throughout the MLRA, is approximately 9.38 inches. However, the dry valleys may have averages as low as 6 inches, while the upper peaks may have averages that exceed 46 inches per year.

Temperatures vary considerably over the year. The average annual temperature is 42.25 degrees F. The average low is 27.4 degrees while the average high temperature is 57 degrees.

In the summer the sun shines 78% of the time, but drops to 40% in the winter. The prevailing wind is location-dependent, and generally flows parallel to the orientation of the dominant valleys. In the summer localized afternoon upslope winds and evening downslope winds are common. The average windspeed is greatest in the spring and early summer.

The frost free period ranges from 102 to 107 days while the freeze free period ranges from 134 to 139 days across the MLRA.

Table 3. Representative climatic features

Frost-free period (average)	107 days
Freeze-free period (average)	139 days
Precipitation total (average)	279 mm

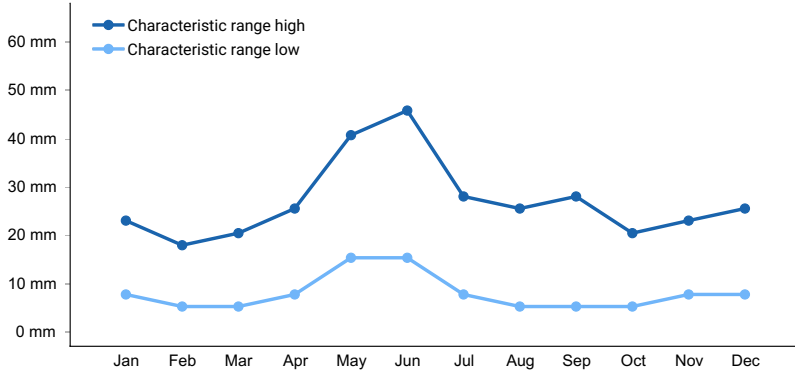


Figure 1. Monthly precipitation range

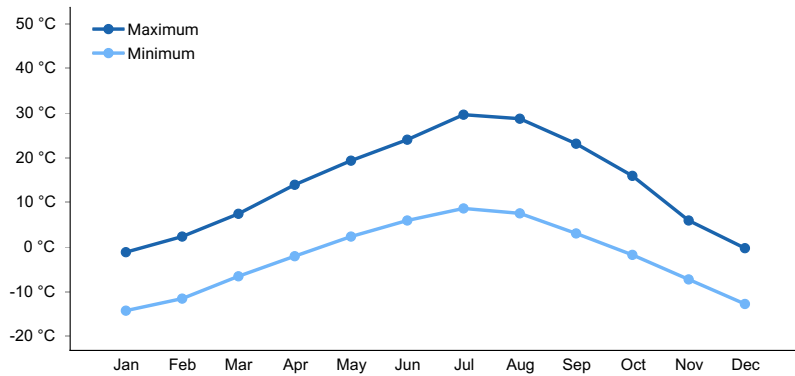


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site is influenced by adjacent streams or run on.

Soil features

The soils on this site are very deep and well drained. Textures range from silt loams to loams on the surface, with very little rock fragments throughout the profile. The parent material consists of alluvium from mixed sedimentary rocks. The soils have a moderate permeability. Available water capacity is low to moderate. These soils are characterized by an arid soil moisture regime. The soil temperature regime is frigid.

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Loam
Drainage class	Well drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	14.48–17.53 cm
Calcium carbonate equivalent (0-101.6cm)	20–30%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	5–15%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

The dominant visual aspect of this site is low growing vegetation dominated by Gardner saltbush, shadscale saltbush and Indian ricegrass. Composition by weight is approximately 30-40% grass, 1-5% forbs and 60-70% shrubs.

In 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 pronghorn antelope, mule deer and lagomorphs.

Fire has historically occurred on the site at intervals of 80-100 years. Fire only occurs in favorable 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 Indian ricegrass, Gardner saltbush and shadscale saltbush. Subdominants include bottlebrush squirreltail, needle and thread and winterfat. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 400 pounds per acre (448 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 (333 Kg/ha). Structurally, medium height shrubs are dominant followed by cool season grasses being more dominant than perennial forbs while shallow rooted bunchgrasses are subdominant.

FUNCTION

This site is suited for spring, fall and winter grazing by domestic livestock. Natural water supplies over much of the site are short or absent. Livestock water may have to be piped, hauled or otherwise made available.

The diversity of vegetation on this site provides important habitat to both large and small wildlife species. Shrubs found within this site provide important food sources to wintering and fawning pronghorn antelope. Gardner saltbush, winterfat, bud sagebrush, shadscale and Wyoming big sagebrush combined with several species of grasses and forbs provide an important variety of forage species for migrating antelope, particularly during springtime. The variety of vegetation provides important habitat for small and non-game wildlife species.

The soils on this site are in hydrologic group B. They have moderately low runoff potential.

Because of the relatively flat slopes and non-stony surface, this site is easily degraded by improper grazing management.

Pronghorn antelope hunting is the major recreational use of this site. Sage grouse hunting is significant but of lesser importance. The site is open space with smooth terrain and low growing vegetation providing an unobstructed view of the adjacent mountains.

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 or killed when burned at a high intensity. Winterfat will re-sprout after a low intensity fire. However, Gardner saltbush will re-sprout after fire, regardless of intensity. Cheatgrass can be a troublesome invader on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency.

Influence of improper grazing management

Gardner saltbush, bud sagebrush, shadscale saltbush and winterfat, along with Indian ricegrass, can all be impacted by improper grazing management. Relatively low levels of utilization by cattle and sheep are needed to maintain the shrub component.

Weather influences

Extended periods of drought reduces vigor of the perennial grasses and palatable shrubs. Extreme drought may cause plant mortality.

Influence of insects and disease

Mormon crickets and grasshopper outbreaks occur occasionally. Since defoliation usually occurs only once during the growing season, little mortality occurs. 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 weeds 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 weed on this site, especially after fire. Once it becomes established the fire frequency increases. As a result, the shrub component can be lost or severely reduced.

Influence of wildlife

Relatively low numbers of wildlife use this site and impact it little. 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. Winter and spring use by mule deer occasionally occurs.

Watershed

Decreased infiltration and increased runoff occurs when Gardner saltbush, bud sagebrush and winterfat is removed with frequent fires, particularly following the fire event. The increased runoff also increases sheet and rill erosion.

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 under improper grazing management.

Phase A to C. Develops with fire (approximately every 80-100 years) and improper grazing management. Fire only occurs in above normal precipitation (favorable) years.

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

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

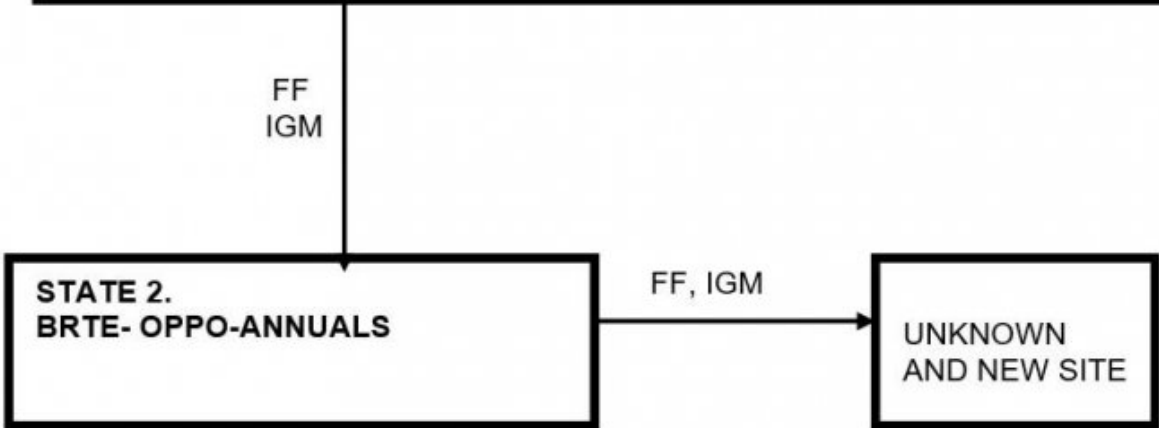
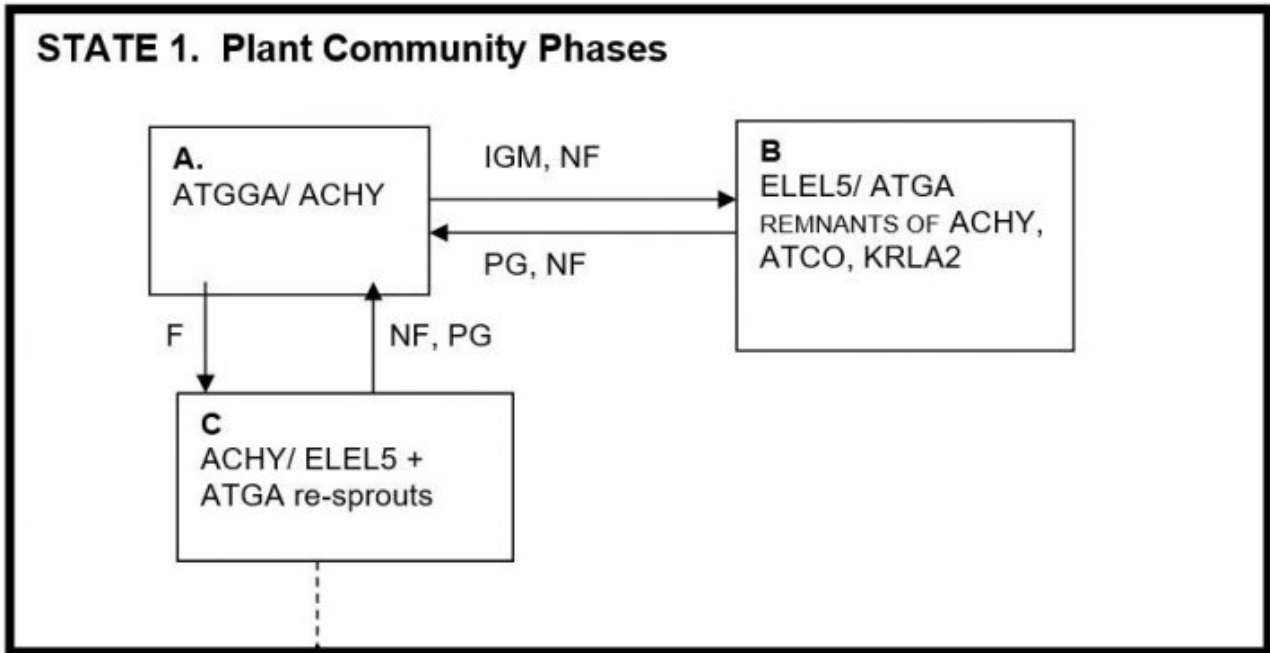
State 1 to 2. Develops from Phase B with frequent fire or from Phase C with improper grazing management and fire.

State 2 to 3. 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 frequent fires.

Practice Limitations.

This site is not well suited to seeding due to the low precipitation and salts in the profile. Brush management is normally not needed or useful on this site.

State and transition model



LEGEND

- IGM- Improper grazing management
- PG- Prescribed grazing
- FF- Frequent fire
- NF- No fire
- F- Fire
- > Community pathway (within states)
- - - - -> Reversible transition
- Threshold
- > Irreversible transition

State 1
State 1, Phase A, Reference Plant Community Phase

Community 1.1
State 1, Phase A, Reference Plant Community Phase

This plant community has Gardner saltbush in the overstory with Indian ricegrass dominating the understory. Winterfat and shadscale saltbush are often present in the community in smaller amounts. Other significant species

in the plant community are bottlebrush squirreltail, Sandberg bluegrass, scarlet globemallow and Hoods phlox. Natural fire frequency is 80-100 years.

State 2
State 1, Phase B

Community 2.1
State 1, Phase B

This plant community is dominated by bottlebrush squirreltail with small amounts of Gardner saltbush remaining. This state has developed due to improper grazing management and lack of fire. There are remnants of Indian ricegrass, winterfat and shadscale saltbush. These deep-rooted bunchgrasses and shrubs are typically in low vigor. Palatable shrubs are hedged.

State 3
State 1, Phase C

Community 3.1
State 1, Phase C

This plant community is dominated by Indian ricegrass and bottlebrush squirreltail. Forbs remain about in the same proportion as Plant Community A. Gardner saltbush has re-sprouted. This state is a result of wildfire.

State 4
State 2

Community 4.1
State 2

This plant community is dominated by cheatgrass and other annuals. Root sprouting shrubs such as rabbitbrush can be present. Plains pricklypear is increasing. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices. This state has developed due to frequent fires and improper grazing management.

State 5
Unknown new site

Community 5.1
Unknown new site

This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This state has developed due to continued improper grazing management and/or frequent fires.

Additional community tables

Animal community

Wildlife Interpretations

Animal Community – Wildlife Interpretations

This rangeland ecological site provides a sparse plant community for select native wildlife species. The plant community exhibits low levels of diversity and productivity of grasses, forbs, and shrubs. Mule deer and pronghorn are the large herbivores using the site during spring and winter months. The rangeland habitat provides seasonal habitat for resident and migratory animals including sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Area sensitive

species may include Great Basin ground squirrel, Townsend pocket gopher, and sage-grouse. Encroachment of noxious and invasive plant species (cheatgrass, Russian thistle, and kochia) 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 – Gardner Saltbush/ Indian Ricegrass 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 leopard lizard, sagebrush lizard, and short horned lizard. Sage-grouse may utilize the site on a limited basis for brood-rearing habitat when adjacent to sagebrush cover. The plant community provides forage throughout the year for large mammals including mule deer and pronghorn. Gardner saltbush, winterfat, and shadscale saltbush provide fair to good feed for deer. Pronghorn utilize the site throughout the year. Winterfat is utilized extensively by rodents, rabbits, birds, and pronghorn. Rodent populations can be high and provide an excellent prey base for raptors.

State 1 Phase 1.2 – Bottlebrush Squirreltail/ Gardner Saltbush/ Shadscale Saltbush/ Winterfat Plant Community: This plant community is the result of improper grazing and lack of fire. The plant community is similar to State 1 Phase 1.1, but with low vigor and reduced canopy cover. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. Insect diversity would be reduced but native forbs are still present and support select pollinators. Habitat quality for reptiles would be reduced to fair for short horned lizard and sagebrush lizard, due to the reduction of Gardner saltbush and other native shrubs. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). The reduction of saltbush and winterfat would reduce the quality of the habitat for mule deer and pronghorn. The populations of small mammals would be dominated by open grassland species.

State 1 Phase 1.3- Indian Ricegrass/ Bottlebrush Squirreltail/ Gardner Saltbush Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. Gardner saltbush would re-sprout adding vertical structure over time. The forbs present would be similar to State 1 Phase 1.1. Diversity of insects would be reduced due to the loss of shrubs. The reptile community would be reduced or eliminated due to the loss of shrubs. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). The decline of Gardner saltbush, winterfat, and shadscale saltbush would lower the quality of habitat for mule deer and pronghorn. Indian ricegrass provides excellent early spring feed for mule deer and pronghorn. Small mammal diversity and populations may be reduced with the loss of cover and enhanced predator hunting success.

State 2 – Sandberg Bluegrass/ Cheatgrass / Annuals Plant Community: This state has developed due to frequent fires and 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. This plant community does not provide the habitat requirements for sage-grouse. Diversity of grassland avian species is reduced due to poor cover and available food. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. 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.

Grazing Interpretations

This site is suited for spring, fall and winter grazing by domestic livestock. Natural water supplies over much of the site are short or absent. Livestock water may have to be piped, hauled or otherwise made available.

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. They have moderately low runoff potential.

Recreational uses

Pronghorn antelope hunting is the major recreational use of this site. Sage grouse hunting is significant but of lesser importance. The site is open space with smooth terrain and low growing vegetation providing an unobstructed view of the adjacent mountains.

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, Idaho
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Kristen May, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD, 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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Contact for lead author	USDA/Natural Resources Conservation Service Brendan Brazee, State Range Conservationist 9173 W. Barnes Drive, Suite C Boise, ID 83709 (208) 378-5722
Date	02/04/2008
Approved by	Kendra Moseley
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 relatively flat slopes.

2. **Presence of water flow patterns:** Water-flow patterns can occur on this site in areas where run-on from adjacent sites occur. When they do occur they are short and disrupted by cool season grasses and shrubs. They are not extensive.

3. **Number and height of erosional pedestals or terracettes:** Erosional pedestals or terracettes rarely occur on this site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Ranges from 70-80 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:** Blowouts and depositional areas are usually not present in the HCPC.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces typically moves up to three feet primarily by wind. 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 6 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 thin platy to weak thick platy. The A or A1 horizon is typically 2 to 6 inches thick. 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 runoff and increase 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):** 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: Medium height shrub>>

Sub-dominant: Cool season perennial grasses> perennial forbs>shallow rooted bunchgrasses.

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 400 pounds per acre (448 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 30-40 percent of the total production, forbs 1-5 percent and shrubs 60-70 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, kochia, Russian thistle, 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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