

Ecological site R011XY012ID

Shallow Stony

8-10 PZ ARAR8/ACTH7-SPCR

Last updated: 4/06/2020
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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): 011X–Snake River Plains

Major Land Resource Area (MLRA): 011X – Snake River Plains Precipitation or Climate Zone: 8-10" P.Z.

Classification relationships

Land Resource Region: B (Northwest Wheat and Range) MLRA: 11 (Snake River Plains) EPA Eco Region: Level III (Snake River Plain)

Ecological site concept

Site does not receive additional moisture Soils are: Not saline or saline sodic Shallow to moderately deep, with >35% coarse fragments (by volume), fragment size is >3". Skeletal not strongly or violently effervescent in the surface mineral 10" Textures are loam in the 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

R011XY004ID	Shallow Loamy 8-12 PZ
R011XY007ID	Gravelly 10-12 PZ
R011XY008ID	South Slope 10-12 PZ
R011XY009ID	Silty 7-10 PZ KRLA2/ACHY
R011XY010ID	Calcareous Loam 7-10 PZ ATCO-PIDE4/ACHY-ACTH7
R011XY011ID	Sand 8-12 PZ ARTRT/ACHY

R011XY014ID	Sandy Loam 8-12 PZ ARTRW8/ACHY-HECOC8
R011XY015ID	Loamy Bottom 8-14 PZ ARTRT/LECI4

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level to hilly slopes ranging from 0 to 15 percent. This site may be found on all aspects with elevations extending from 2600 to 4800 feet (800-1500 meters). This site is associated with old alluvial plains and terraces in the dissected Snake River plains.

Table 2. Representative physiographic features

Landforms	(1) Hill
Elevation	790 – 1,460 m
Slope	0 – 20 %
Water table depth	150 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 11 is part of Idaho's Snake River Plain. The elevation ranges from 2,077 to 7,549 feet, with a mean of 3,992 feet. Most of the precipitation falls as rain in the fall, winter and spring. Very little precipitation occurs during the summer months. In general this MLRA receives more sun than the U.S. average during the summer, but less than average during the winter.

The average annual precipitation is 10.01 inches (based on 10 long term climate stations located throughout the MLRA), with minimum and maximum values of 8.38 and 11.62 inches, respectively.

The average annual temperature ranges from 38° to 65° Fahrenheit. With a maximum average temperature of 65 degrees F. and a minimum average of 38 degrees F. The frost free interval ranges from 139 to 165 days and the freeze free interval ranges from 168 to 196 days.

Table 3 Representative climatic features

Frost-free period (average)	170 days
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Freeze-free period (average)	200 days
Precipitation total (average)	310 mm

Influencing water features

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

Soil features

The soils supporting this site are shallow over fractured basalt. The soils are well drained with moderate permeability above bedrock. A duripan often occurs in the profile. Runoff is negligible to medium. The erosion hazard is severe to very severe by water. The available water holding capacity (AWC) is very low. The surface texture is very stony loam with about 30 percent stones on the surface. These soils are characterized by an aridic soil moisture regime that borders on xeric. Soil temperature regime is mesic.

Soil Series Correlated to this Ecological Site

Mulett

Table 4. Representative soil features

Surface texture	(1) Very stony loam
Drainage class	Well drained
Permeability class	Moderate
Soil depth	30 – 50 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	40 – 50 %
Available water capacity (0-101.6cm)	1.78 – 2.79 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified

Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	30 – 60 %

Ecological dynamics

The dominant visual aspect of this site is low sagebrush with Thurber's needlegrass and sand dropseed. Composition by weight is approximately 20 to 30 percent grasses, 5 to 15 percent forbs, and 55 to 75 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by warm, dry summers and cold 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 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 Thurber's needlegrass, sand dropseed, and low sagebrush. Bottlebrush squirreltail is a subdominant species. There are a variety of other grasses, forbs, and shrubs in minor amounts. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 450 pounds per acre (504 Kg/ha) in a normal year. Production in a favorable year is 600 pounds per acre (672 Kg/ha). Production in an unfavorable year is 300 pounds per acre (336 Kg/ha). Structurally, low shrubs are very dominant, followed by cool season deep rooted perennial bunchgrasses being more dominant than perennial forbs while shallow rooted perennial bunchgrasses are subdominant.

FUNCTION:

This site is well suited for big game spring, fall, and winter use. It is best suited for livestock use in the spring and fall. Natural water sources can be somewhat limited.

This site offers limited values for recreation and aesthetics. Limited opportunities exist for hiking and hunting. Surface stones limit activities.

Due to the low rainfall, surface stones, and gentle topography on this site, it is fairly resistant to disturbances that can potentially degrade the site. For the same reasons, runoff is low and natural erosion hazard is slight.

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 usually are killed when burned. Thurber's needlegrass is also susceptible to mortality after fire. Continued absence of fire may result in an increase in low sagebrush and a corresponding decrease in understory species. Cheatgrass and medusahead can be troublesome invaders on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be detrimental to this site. This type of management leads to reduced vigor of bunchgrasses and low sagebrush. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in Sandberg bluegrass, invasive plants, and annuals. Relatively low levels of utilization by cattle and sheep are needed to maintain the shrub component.

Continued improper grazing management influences fire frequency with an increase in cheatgrass. Early spring grazing by uncontrolled feral horses or cattle can cause severe damage to the understory if these animals are present when the soils are wet and trampling damage occurs.

Weather influences:

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

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.

Influence of Insects and disease:

Outbreaks can affect vegetation health. An outbreak of a particular insect is usually influenced by weather but no specific data is available for this site. Mormon cricket and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

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 very invasive 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 that uses 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. Winter and spring use by mule deer occasionally occurs.

Watershed:

Decreased infiltration and increased runoff on slopes greater than 10 percent occur when low sagebrush is removed with frequent fires, particularly the year following the fire event. Desired understory species can be reduced. This composition change can affect nutrient and water cycles. The increased runoff also increases 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 vegetative 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.
- 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 State 2.

Develops from Phase B with frequent fire or from Phase C with improper grazing management. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated 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 frequent fires. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

Practice Limitations:

Due to the shallowness of the soils, its' low available water holding capacity (AWC), and the surface stones, severe limitations exist for range seeding on this site. Severe limitations also exist for brush management with ground moving equipment due to stoniness. Low potential production and the species involved must be considered if planning brush management.

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 diverse habitat for many native wildlife species. The low level of production and diversity in the plant community limits available forage in all seasons wildlife but can provide important winter habitat for antelope, sage-grouse, and occasionally mule deer. Large herbivore use of the Reference Plant Community (RPC) is by pronghorn antelope and mule deer. The site provides important seasonal habitat for resident and migratory animals including western toad, sagebrush lizard, western rattlesnake, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. A change in the quality of the reference plant community over time can reduce the number and diversity of wildlife species in the area. Fragmentation of the Reference Plant Community (RPC) has reduced the diversity and populations of many native animal species. Area sensitive species include the sage-grouse. In isolated areas encroachment of noxious and invasive plant species (cheatgrass and medusahead) can replace native plant species which provide critical feed, brood-rearing, and nesting cover for a variety of native wildlife. Water is limited, being provided only by seasonal runoff, artificial water catchments, and spring sites. State 1 Phase 1.1 – Low Sagebrush/ Thurber Needlegrass/ Sand Dropseed/ Bottlebrush Squirreltail Reference Plant Community (RPC): This plant community provides a diversity of grasses, forbs, and shrubs used by native insect communities that assist in pollination. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western rattlesnake, western toad, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Spring developments that capture all available water would preclude the use of these sites by amphibians. Critical habitat (leks, winter cover, and winter food) for sage grouse is provided by this diverse plant community. Low sagebrush is a preferred winter food for sage-grouse. The plant community provides limited seasonal forage for large mammals including antelope and mule deer. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots would utilize this community. State 1 Phase 1.2- Sand Dropseed/ Bottlebrush Squirreltail/ Sandberg Bluegrass Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure for animals. Large areas of this plant community may lead to fragmentation of the RPC, effectively changing natural ecological processes and native animal communities. Insect diversity would be reduced but a native forb community similar to State 1 Phase 1.1 would still support select pollinators. Populations of reptiles would be limited or excluded due to the loss of shrub cover. This plant community provides limited brood-rearing habitat for sage-grouse if the site is adjacent to sagebrush cover. Winter cover and winter food for sage-grouse is eliminated. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer, antelope, and elk) use would be seasonal but the site would offer little thermal and young of year cover. Small mammal diversity would be reduced with the loss of vertical structure. Habitat cover would be poor and predator hunting success on small mammals would be greater. State 1 Phase 1.3 – Low Sagebrush/ Sand Dropseed / Sandberg Bluegrass/ Broom Snakeweed Plant Community: This plant community is the result of improper grazing management. An increase in the canopy cover of sagebrush contributes to a sparse herbaceous understory. Grasses, forbs, and shrubs are used by native insects that assist in pollination but the reduced herbaceous understory may result in lower

diversity and numbers of insects. The reptile community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, and western rattlesnake. The reduced diversity and populations of insects may reduce reptile populations and diversity. This plant community supports a variety of migratory and resident avian species for food, brood rearing, and nesting cover. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Critical habitat (leks, winter cover, and winter food) for sage-grouse is available. The plant community supports limited seasonal habitat for large mammals including antelope and mule deer. A small mammal population including golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots would utilize this plant community. State 2 - Sandberg Bluegrass / Cheatgrass / Medusahead/ Invasive Forbs Plant Community: This plant community is the result of continued improper grazing management and/or frequent fire. The plant community does not support a diverse insect community. The reduced forb and shrub components in the plant community would support a very limited diversity of pollinators. Most native reptilian species are not supported with food, water, or cover. This plant community does not support the habitat requirements for sage-grouse. 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 like the Columbian ground squirrel. Predator hunting success would be enhanced due to reduced cover for prey species. Grazing Interpretations. This site is best suited for livestock use in the spring. Vegetation tends to mature and cure out early on this site due to low moisture conditions. Natural water sources are somewhat limited. 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 in this site are in hydrologic group D. They have high runoff potential.

Recreational uses

This site offers limited values for recreation and aesthetics. Limited opportunities exist for hiking and hunting. Surface stones limit activities.

Wood products

None.

Other products

None.

Other information

Field Offices Meridian, ID Caldwell, ID Mountain Home, ID Marsing, ID Payette, ID Weiser, ID Emmett, 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 Dan Ogle, Acting State Rangeland Management Specialist, NRCS, Idaho Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho Leah Juarros, Resource Soil Scientist, NRCS, Idaho Lee Brooks, Range Management Specialist, IASCD

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

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/feis

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, 4/06/2020

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.

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Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	05/07/2009
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 very stony to extremely 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:** both can occur where rills or water flow patterns are present and the surface soils have a high clay content.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** no data for site but expected to range from 20-30 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: usually not present in the Reference State.

7. Amount of litter movement (describe size and distance expected to travel): fine litter in the interspaces typically moves less than one foot due to relatively flat slopes and low rainfall. Coarse litter generally does not move.

8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values): values should range from 4 to 6 but needs to be tested.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Structure ranges from weak to moderate medium granular. Soil organic matter (SOM) is 1 to 2 percent. The A or A1 horizon is typically 2 inches thick.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: bunchgrasses, especially deep rooted perennials, slow runoff and increase infiltration. Medium height shrubs accumulate some snow in the interspaces.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): not present.

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 shrubs

Sub-dominant: cool season deep rooted perennial bunchgrasses

Other: perennial forbs

Additional: 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 shallow in depth.

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): is 450 pounds per acre (504 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 20-30 percent of the total production, forbs 5-10 percent, and shrubs 55-70 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: includes cheatgrass, bulbous bluegrass, rush skeletonweed, scotch thistle, medusahead, spotted and diffuse knapweed, and Russian thistle.
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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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