

Ecological site R010XY002ID

Very Shallow

12-20 PZ ARRI2/POSE

Last updated: 9/23/2020
Accessed: 08/31/2026

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.

Associated sites

R010XY007ID	Loamy 12-16 PZ
R010XY009ID	Stony Loam 12-16 PZ ARTRT/PSSPS
R010XY011ID	South Slope Stony 12-16 PZ ARTRT/PSSPS

Similar sites

R010XY007ID	Loamy 12-16 PZ
-------------	----------------

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on flat to rolling topography. Slopes are 1 to 30 percent. Elevation ranges from 2500 to 4000 feet (750-1200 m). Aspect is variable occurring on many positions.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Fan remnant (3) Mountain slope
Flooding frequency	None
Elevation	760 – 1,220 m
Slope	0 – 30 %
Water table depth	150 cm
Aspect	Aspect is not a significant factor

Climatic features

The elevation of MLRA 10 ranges from 1791 feet to 9236 feet, with a mean of 4602 feet. Overall, elevation increases from west to east. However, average annual precipitation decreases from west to east, ranging from 16.59 inches to 22.17 inches, with a mean of 19.56 inches, based on 7 long term climate stations throughout the MLRA. In general, precipitation peaks in December and January, with a steady decline to a low in July and August, then a steep increase during the autumn months. Most of the winter precipitation falls as snow, and maximum annual snowfalls of up to 82 inches have been recorded.

There is considerable variation in temperature throughout the year. Temperatures as low as -52° Fahrenheit and as high as 117° Fahrenheit are on record. Some areas have recorded the occurrence of more than 50 days with temperatures above 90° Fahrenheit. The average maximum annual temperature is 63 degrees F, while the average minimum temperature is 36.2 degrees F. The frost-free period can range from 128 to 152 days, while the freeze-free period can be from 164 to 189 days.

Both the average morning and average afternoon relative humidity values are lowest in July and August, and are below the national average. The number of clear, sunny days peaks during this same period, and is higher than the national average. During the Spring and Summer months high-intensity convective thunderstorms are not unusual.

Table 3 Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	190 days
Precipitation total (average)	560 mm

Influencing water features

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

Soil features

The soils in this site are very shallow or shallow. Depth is usually less than 10 inches to bedrock, but occasionally may be 12-15 inches deep. Those soils deeper than 10 inches usually have greater than 50 percent by volume of rocks, stones, and gravel, thus resulting in the same plant community as the shallower soil. The soils are well drained with slow to moderately slow permeability. Runoff is medium to very high. The available water holding capacity (AWC) is very low. The erosion hazard is slight to severe. The surface texture is

generally extremely or very stony loam to clay loams. These soils are characterized by a xeric soil moisture regime (Dishner is aridic). Soil temperature regime is mesic. These soils are usually saturated in the early spring and become droughty in the early growing season.

Soil Series Correlated to this Ecological Site

Appleshall
Bakeoven
Devnot
Dishner
Rockly

Table 4. Representative soil features

Surface texture	(1) Extremely stony loam (2) Very stony clay loam (3) Gravelly
Drainage class	Well drained
Permeability class	Slow to moderately slow
Soil depth	10 – 50 cm
Surface fragment cover ≤3"	10 – 30 %
Surface fragment cover >3"	30 – 50 %
Available water capacity (0-101.6cm)	1.27 – 6.6 cm
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 7.8
Subsurface fragment volume ≤3" (Depth not specified)	30 – 50 %
Subsurface fragment volume >3" (Depth not specified)	30 – 50 %

Ecological dynamics

The dominant visual aspect is one of rocky, barren semi-desert covered with stiff sagebrush and low growing Sandberg bluegrass. Composition by weight is approximately 35-45 percent grass, 15-25 percent forbs and 35-45 percent shrubs.

In the last few thousand years, this site has evolved in a semi-arid climate characterized by warm, dry summers and cold, wet winters. Herbivory has historically occurred on the site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, Rocky Mountain elk, sage grouse, lagomorphs and small rodents. Fire has historically occurred on this site every 100-125 years. Fire occurs only in years with above normal precipitation.

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".

This plant community is dominated by Sandberg bluegrass and stiff sagebrush. Subdominant species include bluebunch wheatgrass, bottlebrush squirreltail, eriogonum, phlox, lomatium, pussytoes and Hooker's balsamroot. Total annual production is 125 pounds per acre (140 Kg/ha) in a normal year. Production in a favorable year is 200 pounds per acre (224 Kg/ha). Production in an unfavorable year is 75 pounds per acre (84 Kg/ha). Structurally, cool season shallow rooted bunchgrasses are co-dominant with medium height shrubs while perennial forbs are sub-dominant.

Where bluebunch wheatgrass and bottlebrush squirreltail occur on this site, they are typically growing in an area with slightly deeper soils or in areas of more favorable moisture conditions.

This site is suited for livestock grazing in the spring and fall. Sheep is the best class of livestock to most efficiently use this site due to the dominance of Sandberg bluegrass and the abundance of forbs. This site is easily degraded by livestock and feral horses if they use the site when soils are saturated in the early spring.

The site is considered to be poor to fair habitat for most wildlife species. Pronghorn antelope and mule deer make use of the site in spring, summer and fall after green-up. There is usually insufficient cover for upland game birds, however, sage grouse may use portions of the site for strutting grounds. The site has limited recreational opportunities.

Impacts on the Plant Community.

Influence of fire:

This site historically had a very low fire frequency, approximately every 100-125 years. Most of the shrubs evolved in the absence of fire, therefore they can be severely damaged when burned. Cheatgrass and medusahead can be troublesome invaders on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency. Sandberg bluegrass is usually maintained in the community.

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 bluebunch wheatgrass, bottlebrush squirreltail and other deep-rooted perennial bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in stiff sagebrush, Sandberg bluegrass and invasive species.

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

Proper grazing management that addresses frequency, duration, and intensity can maintain the integrity of the plant community and keep fine fuels from developing. This will reduce fire frequency.

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 influence:

Abnormal weather patterns have little influence on the plant community. They are all adapted to soils with low available water holding capacity. The plants have the ability to become dormant during periods of drought.

Above normal precipitation in April and May can increase total annual production. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Extended periods of drought impact this site due to the low available water holding capacity (AWC) and shallowness of the soil. Extreme drought may cause plant mortality.

Influence of Insects and disease:

Outbreaks of insects can affect vegetation health. An outbreak of a particular insect is usually influenced by weather but no specific data is available for this site.

Influence of noxious and invasive plants:

Annual invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory. Cheatgrass and medusahead rye can be very invasive species on this site, especially after fire. Once they become 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. Pronghorn antelope are the dominant large herbivores using the site. They use the site yearlong but prefer it in the spring, fall and early winter. Sage grouse use the site for strutting grounds. Sage grouse may also use the site during the winter. Winter and spring use by mule deer and Rocky Mountain elk occurs occasionally.

Watershed:

Decreased infiltration and increased runoff on slopes greater than 10 percent occur when stiff sagebrush is removed with frequent fires, particularly the year following the fire event. The increased runoff also increases sheet and rill erosion.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:
State 1.

Phase A to B. Develops with improper grazing management and no fire.

Phase B to A. Develops through prescribed grazing.

Phase A to C. Develops after wildfire.

Phase C to A. Moves towards the HCPC with no fire.

Phase B to C. Develops with wildfire.

Phase C to B. Develops with no fire and improper grazing management.

Practice Limitations.

Severe limitations exist on this site for seeding due to excessive stones on or near the surface. Soil depth also limits available water holding capacity for seedling establishment. Brush management is generally not economically feasible 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 (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Animal community

Wildlife Interpretations. Animal Community – Wildlife Interpretations This rangeland ecological site provides limited habitat for native wildlife species due to shallow soils, exposed rock, a low diversity plant community and low plant production. The plant community

exhibits a diverse mixture of forbs throughout the growing season offering habitat for invertebrates. The site provides seasonal habitat for resident and migratory animals including western toad, sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, sage-grouse, Ferruginous hawk, prairie falcon, horned lark and western meadowlark. Sage-grouse, an area sensitive species, may utilize the sagebrush plant community as lek habitat due to the sites open plant community. Mule deer and elk are the large herbivores using the site. The plant community provides spring and fall feed and limited cover for mule deer and elk. Encroachment of noxious and invasive plant species (cheatgrass and medusahead) 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 streams, artificial water catchments and springs. State 1 Phase 1.1 – Stiff Sagebrush/ Sandberg Bluegrass Reference Plant Community (RPC): This plant community provides a limited 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, short horned lizard, sagebrush lizard and western skink. Sage-grouse may utilize this plant community as lek and brood-rearing habitat. The site may provide winter habitat for sage-grouse. The plant community provides quality feed but poor cover for mule deer. A small mammal population including golden-mantled ground squirrels, kangaroo rats and chipmunks utilize this community. State 1 Phase 1.2 – Stiff Sagebrush/ Sandberg Bluegrass/ Cheatgrass/ Medusahead Rye Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. The reduced herbaceous understory results in reduced diversity and numbers of insects. The reduction of grasses and forbs in the plant community would reduce the available prey species and cover for reptile species identified in Phase 1.1. Winter cover and winter food for sage-grouse is available. The quality of brood-rearing habitat for sage-grouse would decline due to poor plant vigor and lower amounts of herbaceous cover. A small mammal population including golden-mantled ground squirrels, kangaroo rats and chipmunks would continue to utilize this area. State 1 Phase 1.3 –Sandberg Bluegrass/ Cheatgrass/ Medusahead Rye Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush would provide less vertical structure for animals. Insect diversity would be reduced. Reptiles including leopard lizard, short horned lizard and sagebrush lizard would be limited or excluded due to the loss of sagebrush. This plant community provides limited brood-rearing habitat for sage-grouse when adjacent sagebrush cover is present. Winter habitat for sage-grouse is eliminated. Mule deer use would be limited to spring when remaining herbaceous vegetation is 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 and offer poor cover from predators. Grazing Interpretations. This is a low value site for grazing by domestic livestock due to a high percentage of unpalatable forbs and shrubs and overall low annual production. 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. When hydrologic condition of the vegetative cover is good, natural erosion hazard is low to moderate. Because of the rock and gravel on and near the surface, high amounts of run-off can occur during intense storms or extended run-off periods.

Recreational uses

The general appearance of this site lends itself to natural beauty. Some of the flowering plants such as bitterroot lewisia and eriogonum are very colorful while blooming in the springtime. Hunting for chukars, sage grouse, pronghorn antelope, and mule deer is fair when this site is intermingled with foothill and mountain sites.

Wood products

None

Other products

None

Other information

Field Offices Weiser, ID Emmett, ID Mountain Home, ID Meridian, ID Cascade, ID

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Those involved in developing this site description include: Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC Jim Cornwell, Range Management Specialist, IASCD Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho Leah Juarros, Resource Soil Scientist, NRCS, Idaho Lee Brooks, Range Management Specialist, IASCD

Type locality

Location 1: Gem County, ID

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.

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, 9/23/2020

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)	Dave Franzen and Jacy Gibbs Intermountain Range Consultants 17700 Fargo Rd. Wilder, ID 83676
Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	03/26/2008
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rarely occur on this site due to the gravelly and stony surface. If they do occur it will normally be on slopes greater than 10%.

2. **Presence of water flow patterns:** are normally not present 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:** can occur on the site. They are most likely to occur where water flow patterns are present and surface stones are absent. Do not misinterpret frost heaving for pedestals.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** ranges from 30-40 percent but more data is needed.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** does not occur.

7. **Amount of litter movement (describe size and distance expected to travel):** fine litter moves by wind or water. Fine litter can move up to 2 feet after a strong summertime convection storm. Due to the flat slopes, large litter does not move. Much of the fine litter is lost through oxidation.

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):** The A or A1 horizon is typically 3 to 6 inches thick. Structure ranges from weak thin platy to moderate fine granular. Soil organic matter (SOM) ranges from 1 to 3 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** bunchgrasses slow runoff and increase infiltration. Shrubs accumulate some snow in the interspaces. Surface stones are the over-riding influence on infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** may develop on this site. If present it will be relatively thin. Do not misinterpret the Bw horizon at 5-9" as 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: cool season shallow-rooted perennial bunchgrasses= medium shrubs

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. Mortality of stiff sagebrush can occur from large ungulate browsing and trampling.
-

14. **Average percent litter cover (%) and depth (in):** additional data is needed but is expected to be low and at a shallow depth.
-

15. **Expected annual annual-production** (this is TOTAL above-ground annual-production, not just forage annual-production): is 125 pounds per acre (140 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 35-45 percent of the total production, forbs 15-25 percent and shrubs 35-45 percent.
-

16. **Potential invasive (including noxious) species (native and non-native).** List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site: include cheatgrass, medusahead, Vulpia species, bulbous bluegrass and annual mustards.
-

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