

Ecological site R010XY009ID

Stony Loam

12-16 PZ ARTRT/PSSPS

Last updated: 9/23/2020
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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.

Associated sites

R010XY001ID	North Slope Loamy 12-16 PZ FEID-PSSPS
R010XY007ID	Loamy 12-16 PZ
R010XY011ID	South Slope Stony 12-16 PZ ARTRT/PSSPS

Similar sites

R010XY011ID	South Slope Stony 12-16 PZ ARTRT/PSSPS
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level to very steep slopes on all aspects above the Snake River Plains. Slopes are generally less than 30 percent. Elevations generally range from 2500 to 4500 feet (762-1370 m).

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Terrace (3) Fan remnant
Flooding frequency	None
Elevation	760 – 1,370 m
Slope	0 – 70 %
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 on this site are moderately deep. Kepler and Gacey are shallow. Payette is very deep. The soils are well drained with slow to moderate permeability. Runoff is medium to very high. Available water holding capacity (AWC) is very low to moderate. The erosion hazard is slight to severe. The soil texture is extremely stony loam, sandy loam, and clay loam. Stones are present on the surface and throughout the profile. Infiltration and internal water movement is good. These soils are characterized by a xeric soil moisture regime,

Kepler is aridic (torric). Soil temperature regime is mesic.

Soil Series Correlated to this Ecological Site

Deshler
Gacey
Gem
Gimmi
Haw
Immig
Kepler
McDesh
Payette
Perla
Squaw
Sweet

Table 4. Representative soil features

Surface texture	(1) Extremely stony loam (2) Very stony clay loam (3) Extremely cobbly coarse sandy loam
Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	50 – 100 cm
Surface fragment cover <=3"	0 – 30 %
Surface fragment cover >3"	20 – 60 %
Available water capacity (0-101.6cm)	3.3 – 18.54 cm
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10

Soil reaction (1:1 water) (0-101.6cm)	6.1 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	0 – 50 %
Subsurface fragment volume >3" (Depth not specified)	20 – 60 %

Ecological dynamics

The dominant visual aspect of this site is basin big sagebrush and bluebunch wheatgrass with an interspersed of antelope bitterbrush plants. Composition by weight is approximately 60-70 percent grass, 10-20 percent forbs and 10-20 percent shrubs.

In the last few thousand years, this site has evolved in a semi-arid climate characterized by dry summers and cold, wet winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, Rocky Mountain elk and lagomorphs.

Fire has historically occurred on the site at intervals of 25-40 years.

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".

Phase A of this site is dominated by bluebunch wheatgrass and basin big sagebrush. Subdominant species include Idaho fescue, Columbia needlegrass, Sandberg bluegrass, bottlebrush squirreltail, arrowleaf balsamroot, tapertip hawksbeard and antelope bitterbrush.

Total annual production is 1000 pounds per acre (1120 kilograms per hectare) in a normal year. Production in a favorable year is 1200 pounds per acre (1344 kilograms per hectare). Production in an unfavorable year is 600 pounds per acre (670 kilograms per hectare). Structurally, cool season deep-rooted perennial bunchgrasses are very dominant, followed by tall shrubs being co-dominant with perennial forbs while shallow rooted bunchgrasses are subdominant.

This site is suited for domestic livestock grazing in spring, summer and fall. The site has high value as wildlife habitat due to its vegetative diversity, proximity to the Snake River, and surrounding mountains. Due to the stony surface the site is fairly resistant to disturbances that can potentially degrade the site.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, bitterbrush increases to the point of being co-dominant with basin big sagebrush. Grasses and forbs decrease as shrubs increase

When fires become more frequent than historic levels (25-40 years), basin big sagebrush and bitterbrush are reduced significantly. With continued short fire frequency, basin big sagebrush and bitterbrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass and Idaho fescue and Columbia needlegrass. These species may be replaced by cheatgrass at lower elevations, Sandberg bluegrass and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plant species. Medusahead will invade on the soils with the heavier textures.

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 and possibly bitterbrush. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in basin big sagebrush and/or an invasion by noxious and invasive plants.

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

Proper grazing management that addresses frequency, duration, and intensity of grazing over time, can also keep fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in basin big sagebrush. A planned grazing system can also be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned, as a reduction in shrubs without a suitable understory of perennial grasses can increase cheatgrass which will lead to more frequent fire intervals.

Weather influences:

Above normal precipitation in March, April and May 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 the 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. Prolonged drought can lead to a reduction in fire frequency.

Influence of Insects and disease:

Insect and disease outbreaks can affect vegetation health. The tent caterpillar (*Malacosoma fragilis*) defoliates bitterbrush. Two consecutive years of defoliation can cause mortality in bitterbrush.

An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available.

Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency.

Many of the 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 the spring, summer and fall and in moderate winters. Their numbers are seldom high enough to adversely affect the plant community. Herbivory can be detrimental to bitterbrush when livestock grazing and browsing by big game occurs at the same time and season. This will occur when both kinds of animal are using the plant in the late summer or fall. The adverse impact is excessive use of the current year's leader growth.

High numbers of burrowing rodents provide bare ground areas that allow invasion of noxious and invasive species. The deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

Watershed:

Decreased infiltration and increased runoff occur with an increase in basin big sagebrush. 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 no fire.

Phase A to C. Develops with fire.

Phase B to A. Develops with prescribed grazing.

Phase C to A. Develops with prescribed grazing and no fire.

State 1 Phase C to State 2. Develops through frequent fire or continued improper grazing management. This site has crossed the threshold. It is not economically feasible to move it back towards State 1.

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 feasible to move it back towards State 1.

Practice Limitations.

Severe limitations exist on this site for seeding and brush management on this site by conventional ground machinery due to excessive stones on or near the soil surface.

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. Large herbivore use of this ecological site is dominated by mule deer, elk and antelope. Important seasonal habitat is provided 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. Changes in the plant community composition can reduce the number and diversity of wildlife species in the area. With reduced shrub cover, shrub obligate avian and mammal species become rare including brewer's sparrow, sage thrasher and pygmy rabbits. 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 features are sparse provided by seasonal streams, artificial water catchments and springs. State 1 Phase 1.1 - Basin Big Sagebrush/ Bluebunch Wheatgrass/ Sandberg Bluegrass Reference Plant Community (RPC): The RPC provides a diversity of grasses, forbs and shrubs, used by native insect communities who assist in the pollination process for the plant community. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western rattlesnake, western toad, boreal chorus frog 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. Shrub-steppe obligate avian species of concern include the Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Sage-grouse may use the site for nesting and brood rearing. The plant community supports the needs of mule deer and antelope, providing food and cover. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots and pygmy rabbits would utilize the site. State 1 Phase 1.2- Basin Big Sagebrush/ Sandberg Bluegrass Plant Community: This phase has developed due to improper grazing management and no fire. An increase in 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 results in lower diversity and numbers of insects. You can expect a decrease in population and diversity of reptiles due to the reduced diversity and canopy cover of herbaceous vegetation. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Key shrub-steppe obligate avians include Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. The site has poor quality brood-rearing habitat for sage-grouse due to fewer insects and forbs. Winter habitat is available for mule deer and antelope as is young of year cover. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots and pygmy rabbits will utilize this plant

community. State 1 Phase 1.3- Bluebunch Wheatgrass/ Sandberg Bluegrass Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no basin big sagebrush, provides less vertical structure, limiting use by shrub obligate animals. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators. An increase in rabbitbrush would provide fall pollinator habitat. Reptile use, including short horned lizard, sagebrush lizard and western rattlesnakes, would be limited or excluded due to the absence of sagebrush. The dominance of herbaceous vegetation with little sagebrush canopy cover would limit use of these areas for nesting by Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. This plant community provides brood-rearing habitat for sage grouse when adequate sagebrush cover is nearby. Winter habitat for sage-grouse would be lost. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Seasonal forage would be available for mule deer and antelope. The plant community would offer poor thermal cover for deer and elk. Small mammal diversity would be reduced, favoring grass seed eating species. The plant community would not provide suitable habitat for pygmy rabbits. State 2 – Sandberg Bluegrass/ Cheatgrass/ Medusahead Rye Plant Community: This state has developed due to frequent fires and/or improper grazing management. The plant community would not support a diverse insect community. The reduced forb component in the plant community would support a very limited population of pollinators. An increase in rabbitbrush would provide fall pollinator habitat. Most reptilian species would not be supported with food, water or cover. The plant community would not support the habitat requirements for sage-grouse, sage thrasher, Brewer's sparrow or sage sparrow. Grassland avian species would also avoid these areas due to poor food and cover conditions. 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 Sandberg bluegrass and invasive annuals (cheatgrass) would be more palatable. At other times of the year large mammals would not regularly utilize these areas due to its poor food and cover conditions. The populations of small mammals would be dominated by open grassland species. Protection for small mammals from predators would be poor. Grazing Interpretations. The site is best suited for spring, early summer and fall grazing by domestic livestock. 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 C. When hydrologic conditions of the vegetation cover are good, natural erosion hazard is slight to moderate.

Recreational uses

This site has medium values for recreation and natural beauty. Spring and early summer blooming forbs among the stones on the surface offer a pleasing view. It has low value for camping, picnicking, ATV riding and horseback riding due to numerous surface stones. Some hunting of mule deer and upland game birds occurs.

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: Washington 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.

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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.

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Date	03/26/2008
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills: can occur on this site. If rills are present they are likely to occur immediately following wildfire. Rills are most likely to occur on soils with surface textures of silt loam and clay loam.

2. Presence of water flow patterns: occur on this site. When they occur, they are short and disrupted by cool season grasses, tall shrubs and surface stones. They are not extensive. Gravelly to stony surface texture interrupts flows.

3. Number and height of erosional pedestals or terracettes: occur on this site but are not extensive. In areas where flow patterns and/or rills are present, a few pedestals may be expected. Terracettes occur on the site uphill from bases of tall shrubs, large bunchgrasses and surface stones.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground): data is not available. On sites in mid-seral status bare ground may range from 25-35 percent.

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: usually not present. Immediately following wildfire some soil movement may occur on lighter textured soils.

7. Amount of litter movement (describe size and distance expected to travel): fine litter in the interspaces may move up to 3 feet following a significant run-off event. Coarse litter generally does not move. Stones on the surface help reduce fine litter movement.

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 2 to 10 inches thick. Structure ranges from weak fine granular to moderate thin platy. Soil organic matter (SOM) ranges from 1 to 5 percent.

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 run-off and increase infiltration. Tall shrubs catch blowing 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: cool season deep-rooted perennial bunchgrasses

Sub-dominant: tall shrubs=perennial forbs

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): basin big sagebrush will become decadent in the absence of normal fire frequency and ungulate grazing. Grass and forb mortality will occur as tall shrubs increase.
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14. Average percent litter cover (%) and depth (in): additional litter cover data is needed but is expected to be 15-20 percent to a depth of 0.1 inches. Under mature shrubs litter is >0.5 inches deep and is 90-100 percent ground cover.
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15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): is 1000 pounds per acre (1120 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 60-70 percent of the total production, 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: include cheatgrass, medusahead , bulbous bluegrass, rush skeletonweed, musk and scotch thistle and diffuse and spotted knapweed.
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17. Perennial plant reproductive capability: all functional groups have the potential to reproduce in most years.
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