

Ecological site R025XY011ID

LOAMY 13-16

Last updated: 4/24/2024
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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): 025X–Owyhee High Plateau

The Owyhee High Plateau, MLRA 25, lies within the Intermontane Plateaus physiographic province. The southern half is found in the Great Basin while the northern half is located in the Columbia Plateaus. The southern section of the Owyhee High Plateau is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River. The northern section forms the southern boundary of the extensive Columbia Plateau basalt flows. Deep, narrow canyons drain to the Snake River across the broad volcanic plain. This MLRA is characteristically cooler and wetter than the neighboring MLRAs of the Great Basin. Elevation ranges from 3,000 to 7,550 feet on rolling plateaus and in gently sloping basins. It is more than 9,840 feet on some steep mountains. The average annual precipitation in most of this area is typically 11 to 22 inches. It increases to as much as 49 inches at the higher elevations. Precipitation occurs mainly as snow in winter. The supply of water from precipitation and streamflow is small and unreliable, except along major rivers. Streamflow depends largely on accumulated snow in the mountains. The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic or frigid temperature regime and an aridic, arid bordering on xeric, or xeric moisture regime. Most of the soils formed in mixed parent material. Volcanic ash and loess mantle the landscape. Surface soil textures are loam and silt loam, and have ashy texture modifiers in some cases. Argillic horizons occur on the more stable landforms.

Classification relationships

Artemisia vaseyana/ *Festuca idahoensis* ht. Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush- Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35.

Ecological site concept

This ecological site is on backslopes of hills and plateaus. Soils associated with this site formed in colluvium and residuum derived from welded tuff. They are very deep, well drained and characterized by a dark surface horizon (mollic epipedon). Slopes are typically less than 30 percent and elevations range from 5,000 to 6,500 feet (1524 to 1981 meters). Important abiotic factors contributing to the presence of this ecological site include deep, productive soils characterized by clay accumulation and significant amounts of volcanic glass in the subsoil.

Associated sites

R025XY001ID	ASPEN THICKET
R025XY010ID	CLAYPAN 12-16
R025XY017ID	SHALLOW BREAKS 14-18

R025XY039ID	DRY MEADOW
R025XY044ID	VERY SHALLOW STONY LOAM 10-14
R025XY046ID	MEADOW
R025XY043ID	LOAMY 11-13
R025XY035ID	CHURNING CLAY 12-16
R025XY028ID	LOAMY BOTTOM 12-16

Similar sites

R025XY019ID	LOAMY 10-13 ARTRW8 dominant shrub; soils less than 100cm deep to bedrock
R025XY024ID	LOAMY 12-16 ARTRT dominant shrub; restrictive horizon (not bedrock) within 150cm
R025XY022ID	LOAMY 16-22 higher elevation; cryic soil temperature

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> var. <i>vaseyana</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i> subsp. <i>spicata</i> (2) <i>Festuca idahoensis</i>

Physiographic features

This ecological site is on plateaus, tablelands, and foothill landscapes. Sites are commonly found on plateaus, hillsides, and rock pediments. Slopes are typically less than 30 percent. Elevations range from 4,500 to 7,000 feet (1371 to 2133 meters), but are typically between 5,000 to 6,500 feet (1524 to 1981 meters).

Table 2. Representative physiographic features

Landforms	(1) Plateaus or tablelands > Plateau (2) Foothills > Hillside (3) Pediment
Runoff class	Medium
Elevation	1,520 – 1,980 m
Slope	0 – 30 %
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is defined by hot dry summers and cold snowy winters. There are 38 frost free-days and an 81 day freeze-free period. Mean annual precipitation is 15 inches (38cm), with the highest rainfall occurring in May 2.2 inches (5.6cm) and the lowest in August 0.6 inches (1.5cm). Averages snowfall is around 35 inches (89cm) per year. Air temperatures average 26 Degrees F in January (coldest) and 66 Degrees F in July (warmest).

Data was provided by the MTN CITY RS, JACKPOT, and Silver City 5 W climate stations.

Table 3 Representative climatic features

Frost-free period (characteristic range)	20-60 days
Freeze-free period (characteristic range)	60-110 days
Precipitation total (characteristic range)	280-460 mm
Frost-free period (actual range)	10-60 days
Freeze-free period (actual range)	40-110 days
Precipitation total (actual range)	280-510 mm
Frost-free period (average)	40 days
Freeze-free period (average)	80 days
Precipitation total (average)	380 mm

- (1) SILVER CITY 5 W [USC00108412], Murphy, ID
- (2) MTN CITY RS [USC00265392], Mountain City, NV
- (3) CONTACT [USC00261905], Jackpot, NV

Influencing water features

This ecological site is not influenced by adjacent wetlands, streams or run-on. No water table is present.

Wetland description

N/A

Soil features

The soils associated with this site formed in colluvium and residuum derived from welded tuff and volcanic rocks. They are deep and very deep, well drained, and characterized by a accumulation of clay in the subsoil (argillic horizon) between 13 and 40 cm. Surface texture is typically loam, stony-loam or gravelly-loam. Soils are characterized by greater than 35 percent clay in the particle size control section and greater than 5 percent volcanic glass in the upper soil profile.

Representative soil components associated with this ecological site include Hurryback, Amboat, Doodlelink, Paynecreek, Threek and Eep.

Where this ecological site is correlated to moderately deep components including: Monasterio, Hat, Snell, Mulshoe, Kanlee, Takeuchi and Fulcrum full consideration should be given to investigating these correlations and confirming the presence or absence of a Tree State.

Table 4. Representative soil features

Parent material	(1) Colluvium – welded tuff (2) Residuum – volcanic rock
Surface texture	(1) Stony loam (2) Very gravelly loam (3) Very stony sandy loam
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to moderately slow
Soil depth	100 – 150 cm
Surface fragment cover <=3"	10 – 20 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (Depth not specified)	5.08 – 10.16 cm

Soil reaction (1:1 water) (Depth not specified)	6.1 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	20 – 40 %
Subsurface fragment volume >3" (Depth not specified)	10 – 30 %

Ecological dynamics

The Reference Plant Community is dominated by bluebunch wheatgrass, Idaho fescue and mountain big sagebrush. Subdominant species include Sandberg bluegrass, bottlebrush squirreltail, arrowleaf balsamroot, lupine, and antelope bitterbrush. Total annual production is 1100 lbs/acre in a normal year, 1400 lbs/acre in a favorable year, and 800 lbs/acre in a unfavorable year. Structurally, cool season shallow rooted bunchgrasses are dominant, followed by shrubs, perennial forbs, and shallow rooted bunchgrasses. The dominant visual aspect of this site is mixed grasses and mountain big sagebrush. Composition by weight is approximately 55-65 percent grass, 10-20 percent forbs and 20-30 percent shrubs.

High annual precipitation will increase the total plant production. Higher wildfire frequency following annual plant production can be expected due to a larger fuel load (Pilliod, 2017). Extended periods of drought significantly impact this site, native perennial grasses and shrubs depend on annual moisture for successful germination and establishment. Extended drought reduces the vigor of perennial grasses and shrubs, while extreme drought may cause plant mortality. Runoff potential following large precipitation events is medium. Decreased infiltration, increased runoff, and increased erosion often occur when sagebrush is removed by frequent wildfires (C.J. Williams, 2018).

Wildfire frequency across this site has historically been low. Sagebrush evolved with low intensity wildfire that left a mosaic of burned and unburned patches (Baker, 2006). Annual non-native species such as cheatgrass and medusahead can be troublesome invaders on this site after wildfire, preventing perennial grass and shrub re-establishment. Invasive, annual plant communities increase wildfire frequency and intensity (K. Haubensak, 2009). This could cause the dominate shrub population to shift away from mountain big sagebrush to a shrub population with quicker establishment. A complete absence of wildfire could lead Utah Juniper to become the dominant species (MJ Falkowski, 2017).

Herbivory has historically occurred on the site at low levels of utilization. Native herbivores include pronghorn antelope, elk, mule deer, sage grouse, lagomorphs and rodents. Livestock grazing has become prevalent across this site. Overutilization of resources due to grazing (from livestock, wildlife, and feral horses) can degrade the site and decrease forage availability and quality. This will lead to a decrease in perennial bunch grasses and an increase of invasive species (Williamson, 2020). Annual and perennial invasive species compete with desirable plants for moisture and nutrients.

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 (%)
Grass/Grasslike					
1				555-678	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	185-308	–
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	185-308	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	25-62	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	25-62	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	25-62	–
	sedge	CAREX	<i>Carex</i>	0-25	–
	thickspike wheatgrass	ELLA3	<i>Elymus lanceolatus</i>	0-25	–

	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-25	–
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	0-25	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	0-25	–
Shrub/Vine					
2				308-432	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	123-247	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	62-185	–
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	25-62	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-12	–
	yellow rabbitbrush	CHVIP4	<i>Chrysothamnus viscidiflorus</i> ssp. <i>puberulus</i>	0-12	–
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0-12	–
	Woods' rose	ROWO	<i>Rosa woodsii</i>	0-12	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0-12	–
Forb					
3				185-247	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	37-99	–
	lupine	LUPIN	<i>Lupinus</i>	25-62	–
	milkvetch	ASTRA	<i>Astragalus</i>	12-62	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	12-37	–
	fleabane	ERIGE2	<i>Erigeron</i>	0-12	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0-12	–
	Hooker's balsamroot	BAHO	<i>Balsamorhiza hookeri</i>	0-12	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0-12	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0-12	–
	onion	ALLIU	<i>Allium</i>	0-12	–
	aster	ASTER	<i>Aster</i>	0-12	–

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 13. Community 4.1 plant community composition

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

Animal Community – Wildlife Interpretations The rangeland ecological site provides diverse habitat for many native wildlife species. The plant community exhibits a diverse mixture of forbs throughout the growing season offering excellent habitat for invertebrates. Mule deer, and elk may utilize the site at different times of the year. The rangeland habitat provides seasonal habitat for resident and migratory animals including western toad, shrews, bats, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk and prairie falcon. Area sensitive bird species include Brewer's sparrow, sage thrasher, sage sparrow and greater sage-grouse. Water features are sparse provided by seasonal runoff, artificial water catchments and springs. State 1 Phase 1.1 – Mountain Big Sagebrush/ Bluebunch Wheatgrass/ Idaho Fescue/ Antelope Bitterbrush Reference Plant Community (RPC): This plant community provides a diversity of grasses, forbs and shrubs, used by native insect communities that assist in pollination. An extensive array of forbs is represented throughout the growing season leading to a diverse insect community. Many bird and mammal species utilize this habitat based on the availability of invertebrate prey species. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, western toad and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Native shrub-steppe obligate bird species utilizing the habitat include the Brewer's sparrow, sage sparrow and sage thrasher. Sage-grouse habitats (leks, nesting, brood-rearing and winter) are provided by this plant community. The plant community provides seasonal (spring, summer and fall) food and cover for mule deer and elk. South and west facing slopes may provide winter habitat for large herbivores. Antelope bitterbrush may be present in this plant community, along with Idaho fescue and bluebunch wheatgrass are desirable forage species for large herbivores. A small mammal population including golden-mantled ground squirrels, Merriam's shrew, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit and yellow-bellied marmots utilize this plant community. State 1 Phase 1.2 – Antelope Bitterbrush/ Bluebunch Wheatgrass/ Idaho Fescue/ Mountain Big Sagebrush Reference Plant Community (RPC): This state has developed due to fire frequency being much longer than normal. The insect community will be similar to State 1 Phase 1.1 community. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, and western toad. Amphibians are associated with adjacent spring sites. An increase in antelope bitterbrush would provide an increase in quality of available forage for large herbivores. Antelope bitterbrush, along with Idaho fescue and bluebunch wheatgrass are desirable forage species for large herbivores. During mild winters, south and west facing slopes would provide winter habitat for large herbivores. Thermal cover and young of year cover would be provided to mule deer, elk and pronghorn. A small mammal population including golden-mantled ground squirrels, Merriam's shrew, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit and yellow-bellied marmots utilize this plant community. State 1 Phase 1.3- Mountain Big Sagebrush/ Sandberg Bluegrass / Bluebunch Wheatgrass/ Idaho Fescue/ Western Juniper Plant Community: This state has developed due to improper grazing management with no fire. An increase in canopy of sagebrush and junipers contributes to a sparse herbaceous understory. A reduced herbaceous understory results in less diversity and numbers of insects. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, and western toad. Amphibians are associated with adjacent spring sites. The reduced diversity of insects and understory cover may reduce quality of food and cover for the reptile community. As juniper increases, habitat quality for Brewer's sparrow, sage thrasher and sage sparrow may decrease. Remaining sagebrush provides brood-rearing, winter cover and winter food for sage-grouse but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community supports limited seasonal (spring and fall) habitat for elk. The quality of spring, fall and winter habitat for mule will increase. As juniper encroaches the site will provide additional thermal cover for large mammals. A small mammal population including golden-mantled ground squirrels, Merriam's shrew, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit and yellow-bellied marmots utilize this plant community. State 1 Phase 1.4 – Bluebunch Wheatgrass/ Idaho Fescue/ Sandberg Bluegrass Plant Community: The plant community is a result of recent wildfire, prescribed burning or brush management. The plant community, dominated by herbaceous vegetation with little or no sagebrush would provide less vertical structure for animals. An increase in rabbitbrush may add additional vertical structure for animals over-time. Insect diversity would be reduced but a native forbs plant community similar to State 1 Phase 1.1 would still support select pollinators. Habitat for common sagebrush lizard and western rattlesnake would be limited due to the loss of sagebrush. The dominance of herbaceous vegetation with little sagebrush canopy would limit use of these areas as nesting habitat by Brewer's sparrow, sage sparrow and sage thrasher. Brood-rearing habitat for sage-grouse would be provided if site is adjacent to sagebrush cover. The dominant herbaceous vegetation improves habitat for grassland bird species (horned lark, savannah sparrow, vesper sparrow and western meadowlark). Mule deer and elk use would be seasonal (spring and fall) and site would offer little thermal cover and young of year cover due to the loss of shrub cover. The diversity and populations of small mammals would be dominated by open grassland species. Large blocks of this plant community would fragment historic plant community and reduce the quality of habitat for shrub-steppe obligate animal species. State 1 Phase 1.5 – Mountain Big Sagebrush / Bluebunch Wheatgrass/ Idaho Fescue/ Antelope Bitterbrush/ Western Juniper Plant Community: This plant community is the result of no fire. The insect community would be similar to State 1 Phase 1.1 insect community. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake and western toad. Amphibians are associated with springs adjacent to the site. Shrub-steppe obligate bird species include Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Habitat (brood-rearing and nesting cover) quality for sage-grouse is reduced due to an increase in juniper canopy into the plant community. Winter habitat (cover and food) for sage-grouse is provided. As juniper increases in cover the quality of habitat for sage-grouse will be severely reduced or eliminated. The reduced vigor of understory vegetation provides for a shorter foraging season for mule deer and elk. Young of year cover would be provided for mule deer, elk and pronghorn. Quality of winter habitat for mule deer will increase as juniper cover increases. Small mammal diversity and populations would be similar to State 1 Phase 1.1 small mammal community. State 1 Phase 1.6- Mountain Big Sagebrush/ Sandberg Bluegrass / Bluebunch Wheatgrass/ Idaho Fescue Plant Community: This state has developed due to improper grazing management and a lack of fire. An increase in canopy of sagebrush contributes to a

sparse herbaceous understory. A reduced herbaceous understory results in less diversity and numbers of insects. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, and western toad. Amphibians are associated with adjacent spring sites. The reduced diversity of insects and understory cover may reduce quality of food and cover for the reptile community. Brewer's sparrow, sage thrasher and sage sparrow habitat is provided on this site. Nesting, brood-rearing and winter habitat for sage-grouse is provided on this site. The plant community supports seasonal forage for mule deer and elk. A small mammal population including golden-mantled ground squirrels, Merriam's shrew, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit and yellow-bellied marmots utilize this plant community. State 2 Phase 2.1 – Mountain Big Sagebrush/ Annuals Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy of sagebrush and improper grazing management contributes to an increase in cheatgrass. The reduced diversity of herbaceous understory and increase in invasive plants results in less diversity of insects. The reptile community is similar to State 1, Phase 1.6 reptile community. The reduced diversity of insects may reduce reptile diversity and populations. Reduced perennial herbaceous understory will lower quality of habitat for ground nesting bird species. Bird species utilizing the site include Brewer's sparrow, sage sparrow, sage-grouse and sage thrasher. Quality of habitat (brood-rearing and nesting cover) for these bird species is reduced due to poor vigor and less diversity in the herbaceous plant community. Winter habitat (cover and food) for sage-grouse is provided. Limited forage for large mammals is available in the spring when annuals are more palatable. Young of year cover would be provided for mule deer and elk. Small mammal diversity and populations would be similar to State 1, Phase 1.1 small mammal community. State 2 Phase 2.2– Sandberg/ Annuals/ Forbs/ Tall Green Rabbitbrush Plant Community: The community has developed due to continued improper grazing management and frequent fire. The plant community does not support a diverse insect community. The reduced forbs and shrubs in the plant community would support a very limited population of pollinators. Quality of food and cover habitat for reptilian species is reduced. This plant community does not support the life requisites for sage thrasher, Brewer's sparrow, sage-grouse or sage sparrow. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large herbivores may utilize the herbaceous vegetation in spring and early summer when the vegetation is more palatable. The diversity and populations of small mammals would be dominated by open grassland species. Large blocks of this plant community would fragment historical plant community and reduce the quality of habitat for shrub-steppe obligate animal species. State 3 – Western Juniper/ Sandberg Bluegrass/ Annuals Plant Community: This site has developed due to improper grazing management and no fire. The loss of native forbs and understory vegetation will reduce insect diversity on the site. This plant community does not support life requisites for sage-grouse. Birds using this site as resident or migratory habitat include Juniper titmouse, western bluebird and Virginia's warbler. The Juniper titmouse relies heavily on juniper seeds for winter food. Hunting success on the site by raptors may decrease due to heavy overstory of juniper. Hunting success by raptors on adjacent ecological sites may increase due to an increase in roosting sites. As juniper increases, the site will provide additional thermal cover for large mammals. This site can provide food and cover for mule deer in spring, fall and winter. State 4 - Range Seeding Plant Community: The proposed seeding mixture (native or non-native) would determine the animal species that would utilize the area. A diverse seed mixture of grasses and forbs would provide similar habitat conditions as in the herbaceous plant community described in State 1 phase 1.4. A diverse seed mixture of grasses, forbs and shrubs would provide similar habitat conditions as described in State 1 phase 1.1, 1.2 or 1.6. A monoculture of non-native grass species would not support diverse populations of insects, reptiles, birds or mammals. Sagebrush obligate animal species would not be supported with a monoculture of grass. Animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat, mule deer and antelope would utilize this site for nesting and/or seasonal foraging. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large blocks of this plant community would fragment historic plant community and reduce the quality of habitat for shrub-steppe obligate animal species. Grazing Interpretations. This site is best suited for late spring, summer and fall grazing. 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.

Hydrological functions

The hydrology of this site is characterized by occasional high intensity thunderstorms during the summer months but primarily by low intensity frontal storms during the winter and spring. Sixty to 70 percent of the precipitation falls during the period of October through May. Winter precipitation is in the form of snow. Snowmelt and run-off are critical events on this site. The site needs to be protected by vegetation when snowmelt and run-off occur. Ponding and flooding do not occur on this site. Run-on from adjacent sites normally does not occur. This site is in a snow-accumulation zone due to its high elevation and precipitation zone. In the HCPC, the flatter slopes on which this site occurs allow for the majority of the moisture to infiltrate into the soil profile. State 1. Historic Climax Plant Community (HCPC). Infiltration is good and runoff is low. The HCPC optimizes this relationship. The erosion potential is low. Cryptogamic crusts occur frequently on the site. Within this state, shrub cover varies from phase to phase. Where shrubs are abundant, snow accumulates in the interspaces. Phase D, where shrub cover is reduced or absent (due to recent fire), snow accumulation is reduced due to drifting snow and is unevenly redistributed. Snowmelt rates will be faster and result in increased runoff and less infiltration in the unprotected areas of the site. Total annual production of the site may be reduced. Deep percolation may be increased where more snow accumulates after redistribution by wind. State 2. Phase 2.2 is dominated by Sandberg bluegrass and other annual and perennial grasses and forbs in the understory. Root sprouting shrubs such as green rabbitbrush and gray horsebrush are present. Less snow accumulation may result from the lack of shrubs in phase B. This state has more bare ground than the HCPC which results in a more rapid runoff. Phase A is dominated by mountain big sagebrush with annuals in the interspaces. This state has developed due to improper grazing management and the absence of fire. Snow accumulation in the interspaces will be greater in this phase than in phase B. State 3. This plant community is dominated by juniper. Remnants of bluebunch wheatgrass and Idaho fescue can be found in the understory. Shallow-rooted grasses, such as Sandberg bluegrass, and other annuals can be found in the interspaces. Few shrubs are present. This state has developed in the absence of fire. The heavy overstory of juniper intercepts snow in the branches and much of it is lost to sublimation. Infiltration is reduced in the interspaces and runoff is more rapid. Soil erosion is occurring, primarily in the interspaces. State 4. Seeding. The seeding may consist of introduced species or may be made up of native species that attempt to mimic the historic plant community.

Hydrologically, a native seeding that mimics the HCPC, will be similar to state 1, the HCPC. Where shrubs successfully establish or increase naturally into the seeding, snow accumulation will occur resulting in improved deep percolation and slower runoff.

Recreational uses

Recreation use of this site includes hunting, hiking, horseback riding, plant and animal observation and motorized vehicle use. Due to the relative abundance of wildlife that use this site, hunting is one of the primary uses. ATV's use this site due the gentle topography and relatively non-stony surface horizon.

Wood products

Mature juniper that has invaded and increased on the site can be cut for posts, poles, firewood and lumber.

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, State Rangeland Management Specialist, NRCS, Idaho (Retired) Joe May, State Rangeland Management Specialist, NRCS, Idaho Leah Juarros, Resource Soil Scientist, NRCS, Idaho Lee Brooks, Assistant State Conservationist, NRCS, Idaho (Retired)

Type locality

Location 1: Owyhee County, ID	
Township/Range/Section	T3S R3W S36
General legal description	SE 1/4, NE 1/4, SEC. 36
Location 2: Owyhee County, ID	
Township/Range/Section	T4S R3W S10
General legal description	NE 1/4, SW 1/4, SEC 10.
Location 3: Owyhee County, ID	
Township/Range/Section	T13S R18E S34
General legal description	SW 1/4, NE 1/4, SEC. 34

References

Baker, W.L. 2006. Fire and Restoration of Sagebrush Ecosystems. Wildlife Society Bulletin 34:177–185.

Haubensak K. and D'Antonio C. 2009. Effects of fire and environmental variable on plant structure and composition in grazed salt desert shrublands of the Great Basin (USA). *Journal of Arid Environment*. Elsevier. 643–650.

Michael J. Falkowski and Jeffrey S. Evans. January 2017. Mapping Tree Canopy Cover in Support of Proactive Prairie Grouse Conservation in Western North America. *Rangeland Ecology and Management* 70:15–24.

Pilliod, D.S. and J.L. Welty. 2017. Refining the cheatgrass–fire cycle in the Great Basin: Precipitation timing and fine fuel composition predict wildfire trends. *Ecology and Evolution*. Wiley.

Williams, C.J. and F.B. Pierson. 2018. Effectiveness of prescribed fire to re-establish sagebrush steppe vegetation and ecohydrologic function on woodland-encroached sagebrush rangelands, Great Basin, USA: Part I: Vegetation, hydrology, and erosion responses.

Williamson, M.A. and E. Fleishman. 2019. Fire, livestock grazing, topography, and precipitation affect occurrence and prevalence of cheatgrass (*Bromus tectorum*) in the central Great Basin, USA.

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.

Petersen, S.L., 2004. A Landscape-Scale Assessment of Plant Communities, Hydrologic Processes, and State-and-Transition Theory in a Western Juniper Dominated Ecosystem. PhD Dissertation. Oregon State University, Corvallis, Oregon.

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.

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Approval

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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	06/13/2007
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Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Rills rarely occur on this site. If rills are present, they are likely to occur on slopes greater than 20 percent and 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:** Water-Flow patterns rarely occur on this site. When they occur, they are short and disrupted by cool season grasses, tall shrubs and surface gravels or stones and are not extensive.

- 3. Number and height of erosional pedestals or terracettes:** Pedestals and/or terracettes are rare on this site. In areas where slopes approach 20 percent and where flow patterns and/or rills are present, a few pedestals may be expected.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** On sites in mid-seral status, bare ground may range from 25-45 percent.

- 5. Number of gullies and erosion associated with gullies:** None.

- 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 2 feet following a significant run-off event. Coarse litter generally does not move.

- 8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values should range from 3 to 5 .

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): The surface horizon is typically 4 to 9 inches thick. Structure typically includes weak thin and moderate platy, weak to strong fine and medium granular, and weak fine to medium subangular blocky. 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 accumulate 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>shallow rooted bunchgrasses

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Mountain big sagebrush will become decadent in the absence of fire and ungulate grazing. Grass and forb mortality will occur as tall shrubs increase.

14. Average percent litter cover (%) and depth (in): Additional litter cover data is needed but is expected to be 20-25 percent to a depth of 0.2 inches. Under mature shrubs litter is >0.5 inches deep and is 90-100 percent ground cover.

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): 1100 pounds per acre (1232 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 55-65 percent of the total production, forbs 10-20 percent and shrubs 20-30 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: Invasive Plants include bulbous bluegrass, whitetop, rush skeletonweed, musk and scotch thistle and diffuse and spotted knapweed.

17. Perennial plant reproductive capability: All functional groups have the potential to reproduce in most years.
