

Ecological site R010XA010ID

North Slope Fractured

16-22 PZ

Last updated: 4/01/2025
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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): 010X–Central Rocky and Blue Mountain Foothills

This MLRA is characterized by gently rolling to steep hills, plateaus, and low mountains at the foothills of the Blue Mountains in Oregon and the Central Rocky Mountains in Idaho. The geology of this area is highly varied and ranges from Holocene volcanics to Cretaceous sedimentary rocks. Mollisols are the dominant soil order and the soil climate is typified by mesic or frigid soil temperature regimes, and xeric or aridic soil moisture regimes. Elevation ranges from 1,300 to 6,600 feet (395 to 2,010 meters), increasing from west to east with higher elevations reaching 9250 feet on the northern fringe of the MLRA. The climate is characterized by dry summers and snow dominated winters with precipitation averaging 8 to 16 inches (205 to 405 millimeters) and increasing from west to east. Higher elevations on the northern fringe of this MLRA receive upwards of 41 inches in precipitation. These areas are the foothills and lower mountain side slopes as the MLRA transitions into MLRA 43C. These factors support plant communities with trees and shrub-grass associations with considerable acreage of sagebrush grassland. Western juniper is one of the few common tree species and since European settlement has greatly expanded its extent in Oregon. Nearly half of the MLRA is federally owned and managed by the Bureau of Land Management. Most of the area is used for livestock grazing. For further information, see "Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin (U.S. Department of Agriculture Handbook 296, 2006)" available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053624

Ecological site concept

- Site occurs on Uplands
- Slopes greater than 30% on northerly aspects
- Site occurs in 16-22 PZ
- Soils are 20" to fractured bedrock or clay.
- Roots penetrate below 20".

Associated sites

R010XA011ID	Clayey North 16-22 PZ Adjacent shallow north aspects occurring on unfractured rock
R010XA014ID	Steep South Slope 16-22 PZ Adjacent steep south aspects, >45% slope
R010XA015ID	South Slope Loamy 16-22 PZ Adjacent south aspects, <45% slope
R010XA016ID	Quaking Aspen 20+ PZ POTR5 Adjacent moisture accumulating depressions supporting aspen communities

Similar sites

R010XA008ID	North Slope Loamy 16-22 PZ Soils are >20" to bedrock or clay
R010XA011ID	Clayey North 16-22 PZ Roots do not penetrate below 20", Restrictive clay layer at 4 to 10 inches

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. vaseyana</i>
Herbaceous	(1) <i>Festuca idahoensis</i>

Physiographic features

This site occurs on steep to very steep north and east facing aspects. Slopes are 30 to 75 percent. The elevations range from 5200 to 8500 feet (1585 to 2590 meters).

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain (2) Foothills > Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	1,590 – 2,590 m
Slope	30 – 80 %
Water table depth	150 cm
Aspect	N, NE, E

Climatic features

The Big and Little Wood River Foot slopes and Plains, proposed as MLRA 10X, has a mean elevation of 5310 feet above sea level, and varies from 3600 to 9235 feet. In general, average annual precipitation is greatest on the western side, with the southeast area being the driest. However, the northern fringe receives upwards of 41 inches of precipitation. Monthly precipitation is generally greatest at the end of the year, diminishes steadily until a

low in July and August, then increases rapidly in the autumn. Monthly temperatures can vary considerably. Highs of up to 102° and lows down to -52° Fahrenheit have been recorded. The average annual temperature is 42.9°. The frost-free period ranges from 60 to 85 days. The freeze-free period is a bit longer: 80 to 105 days.

Both morning and afternoon average relative humidity values peak in the winter, and reach their low in July and August. The average number of sunny, cloud-free days is above average for the summer months, but below average for the period from November through February.

Table 3 Representative climatic features

Frost-free period (characteristic range)	60-90 days
Freeze-free period (characteristic range)	80-110 days
Precipitation total (characteristic range)	410-560 mm
Frost-free period (average)	70 days
Freeze-free period (average)	100 days
Precipitation total (average)	460 mm

Influencing water features

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

Wetland description

This site is not influenced by adjacent wetlands.

Soil features

The soils on this site are dark colored very gravelly and very cobbly fine sandy loams. They are less than 20 inches deep to fractured limestone or quartzite sandstone bedrock. The fractures allow the roots of the shrubs to go below 20 inches. They are well drained, with moderately rapid permeability and very low available water holding capacity. Runoff is medium. Erosion by water is low to moderate when plant cover is scarce or lacking. The surface texture is very gravelly fine sandy loam. These soils are characterized by a xeric moisture regime. Soil temperature regime is cryic.

Table 4. Representative soil features

Parent material	(1) Colluvium – quartzite
Surface texture	(1) Very gravelly fine sandy loam
Drainage class	Well drained
Permeability class	Moderately rapid

Soil depth	30 – 50 cm
Surface fragment cover <=3"	20 – 30 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	1.78 cm
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	50 – 60 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

The dominant visual aspect of this site is mountain big sagebrush overstory with Idaho fescue and various forbs. Composition by weight is approximately 50 to 60 percent grasses, 20 to 25 percent forbs, and 15 to 25 percent shrubs.

During 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 mule deer, Rocky Mountain elk, and lagomorphs.

Fire has historically occurred on the site at intervals of 20 to 50 years.

The the Reference State (State 1), historically referred to as the Historic Climax Plant Community (HCPC), 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.

FUNCTION:

This site is well suited for big game in the late spring, summer, and fall. It is also well suited for livestock and recreation use in the late spring, summer, and fall.

Due to the relatively high rainfall and elevation on this site, it is fairly resistant to disturbances that can potentially degrade it.

Water intake and internal drainage is moderate. Runoff, when it does occur is non-erosive except during high intensity convection storms. Snow accumulates on the site due to high elevation and presence of tall shrubs.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, mountain big sagebrush, and antelope bitterbrush increases. Grasses and forbs decrease as shrubs increase.

When fires become more frequent than historic levels (20-50 years), mountain big sagebrush and bitterbrush are reduced significantly. With continued short fire frequency, mountain big sagebrush and antelope bitterbrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass and Idaho fescue. These species may be replaced by cheatgrass and/or bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass comes in at lower elevations on the site. These fine fuels will increase the fire frequency. Root sprouting shrubs such as rabbitbrush and mountain snowberry may increase.

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 reducing 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 mountain big sagebrush and noxious and invasive plants. As cheatgrass increases, along with other annuals, fires become frequent. Continued improper grazing management influences fire frequency by increasing fine fuels.

Proper grazing management that addresses frequency, duration, and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in mountain big sagebrush. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn.

Due to the shrub species on this site, any brush management efforts should be carefully planned. Antelope bitterbrush is very important as a browse species for wildlife and needs to be protected with any brush control practices applied. A reduction in shrubs without a suitable understory of perennial grasses can lead to an increase in fine fuels which will lead to a more frequent fire regime. Loss of shrub species on this site can have very negative impacts on wildlife.

Weather influences:

Above normal precipitation in April, May, and June 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 these 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. Mortality can occur. Prolonged drought can lead to a reduction in fire frequency.

Influence of Insects and disease:

Outbreaks can affect vegetation health, particularly bitterbrush from western tent caterpillars (*Malacosoma fragilis*). Two consecutive years of defoliation by the tent caterpillar 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. 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. Snow-mold can impact mountain big sagebrush.

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 annual and perennial invasive species with deep root systems 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 late spring, summer, and fall. 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 years' leader growth.

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 the increase in mountain big sagebrush. Desired understory species can be reduced. The increased runoff also causes sheet and rill erosion. This composition change can affect nutrient and water cycles. 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.

Practice Limitations:

Mechanical seeding is generally not feasible on the steeper slopes on this site. Mechanical brush control is difficult or not feasible on steep slopes. Brush management can occur with aerial chemical application or prescribed burning.

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				219-493	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	112-224	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	28-56	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	11-28	–
	mountain brome	BRMA4	<i>Bromus marginatus</i>	1-17	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	1-17	–
Forb					
2				95-224	
	lupine	LUPIN	<i>Lupinus</i>	39-90	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	17-34	–
	balsamroot	BALSA	<i>Balsamorhiza</i>	11-34	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	11-28	–
	phlox	PHLOX	<i>Phlox</i>	11-28	–
	erigenia	ERIGE	<i>Erigenia</i>	6-11	–
	agoseris	AGOSE	<i>Agoseris</i>	1-11	–
	rockcress	ARABI2	<i>Arabis</i>	1-11	–
Shrub/Vine					
3	Shrubs			78-179	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	56-140	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	17-34	–
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	11-22	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	1-17	–
	buckwheat	ERIOG	<i>Eriogonum</i>	1-11	–

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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Animal community

Wildlife Interpretations. Animal Community – Wildlife Interpretations This 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. Wildlife use these areas on a seasonal basis due to the high elevation, short growing season and temperature regimes. Mule deer and elk are the large herbivores using the site. The site provides seasonal habitat for resident and migratory animals including western toad, sagebrush lizard, shrews, bats, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie

falcon, horned lark and western meadowlark. Sagebrush obligate avian and mammal species including sage-grouse, Brewer's sparrow, sage thrasher and pika utilize these sites on a limited basis due to the high elevation and associated cold temperatures throughout much of the year. Sage-grouse an area sensitive species, may utilize the sagebrush plant community as winter and brood-rearing habitat. A change in the quality of the historic plant community over time can reduce the numbers and diversity of native wildlife species in the area. Encroachment of noxious and invasive plant species (cheatgrass and medusahead) in isolated areas can replace native plant species which provide critical feed, brood-rearing and nesting cover for a variety of native wildlife. The loss of herbaceous understory vegetation has a negative impact on ground nesting birds, while the loss of shrub cover negatively affects both ground and shrub nesting avians. Water features are sparse provided by seasonal streams, artificial water catchments and springs.

State 1 Phase 1.1 – Mountain Big Sagebrush/ Idaho Fescue/ Bluebunch Wheatgrass 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 avian and mammal species utilize this habitat based on the availability of invertebrate prey species. 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. Native shrub-steppe obligate avian species utilizing the habitat include the Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Sage-grouse may utilize this plant community on a limited basis for winter and brood-rearing habitat due to the sites high elevation. The plant community provides limited seasonal forage needs for large mammals including mule deer and elk. A diverse small mammal population including golden-mantled ground squirrels, chipmunks and yellow-bellied marmots utilize this community. Pikas may utilize the site if adjacent to rocky open areas. Habitat for the pygmy rabbit would be marginal due to shallow soils, steepness and high elevation. The deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

State 1 Phase 1.2- Mountain Big Sagebrush/ Mountain Brome/ Slender Wheatgrass Plant Community: This plant community is the result of improper grazing management and no fire. An increase in the canopy cover of sagebrush and antelope bitterbrush contributes to a sparse herbaceous understory. Native insects assist in pollination but the reduced herbaceous understory results in reduced diversity and numbers of insects. The reptile community is represented by leopard lizard, short horned lizard, sagebrush lizard and western skink. The reduction of grasses and forbs in the plant community would reduce the available prey species and cover for these resident reptile species. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collected all available water would exclude the use of amphibians on these sites. This plant community supports a less diverse variety of migratory and resident avian species with the reduced understory vegetation. Fewer prey species and less understory cover results in limited food, brood-rearing and nesting habitat. Key shrub-steppe avian obligates include Brewer's sparrow, sage sparrow, sage thrasher and sage- grouse. Critical habitat (winter cover and winter food) for sage grouse is available. The plant community supports limited seasonal habitat for large mammals including mule deer, and elk. A small mammal population including golden-mantled ground squirrels, chipmunks and yellow-bellied marmots utilize these areas. Pikas may be present in areas with adjacent open rocky habitat. The deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

State 1 Phase 1.3 – Bluebunch Wheatgrass/ Mountain Brome/ Slender Wheatgrass Plant Community Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush or antelope bitterbrush would provide less vertical structure for animals. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators. The reptiles including short horned lizard and sagebrush lizard would be limited or excluded due to the loss of sagebrush. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collected all available water would exclude the use of amphibians on these sites. The dominance of herbaceous vegetation with little sagebrush canopy would prevent use of these areas as nesting habitat by Brewer's sparrow, sage sparrow, sage thrasher, and sage- grouse. This plant community provides limited brood-rearing habitat for sage- grouse if adjacent sagebrush cover is provided. Winter habitat for sage-grouse is eliminated. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer, and elk) use would be seasonal and offer little thermal cover and young of year cover. The diversity and populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

State 2 - Cheatgrass / Bulbous Bluegrass Plant Community: This plant community is the result of continued improper grazing management and/or frequent fire. Invasive herbaceous plants and patches of root sprouting shrubs like rabbitbrushes and mountain snowberry can be present. The plant community does not support a diverse insect community. The reduced forb and shrub component in the plant community would support a very limited population of pollinators. Most reptilian species are not supported with food, water or cover. This plant community does not support the habitat requirements for sage-grouse, sage thrasher, Brewer's sparrow or sage sparrow. 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 diversity and populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

Grazing Interpretations. It is best suited for livestock use in the late spring, summer, and fall. 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 soils in this site are in hydrologic group D. When ground cover is at or near potential the erosion hazard is slight to moderate.

Recreational uses

This site provides opportunities for big game hunting and hiking. Flowering forbs in the spring offer photographic opportunities.

Wood products

None

Other products

None

Other information

Field Offices Mountain Home, ID Gooding, ID Shoshone, ID Rupert, ID Arco, 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

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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.

Contributors

Dave Franzen And Jacy Gibbs

Approval

Kirt Walstad, 4/01/2025

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
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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	03/28/2008
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** rills can occur on this site. If rills are present they are likely to occur immediately following wildfire. Gravelly and cobbly surface soils reduce the potential for rills. 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 occur on this site. When they occur, they may be long, continuous and extensive. Gravelly and cobbly surface texture interrupts flows.

- 3. Number and height of erosional pedestals or terracettes:** both can occur on this site. In areas where flow patterns and/or rills are present, a few pedestals may be expected. Terracettes also occur on the site uphill from tall shrub bases and large bunchgrasses. They are not extensive.

- 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 10-25 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 5 feet following a significant run-off event. Coarse litter generally does not move. Gravels and cobbles on the surface help reduce fine litter movement. Terracettes, gravels, and cobbles can trap fine litter.

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.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): structure is generally weak fine granular. Soil organic matter (SOM) needs to be determined. The A or A1 horizon is typically 7 inches thick. Surface soil color is very dark grayish brown moist.

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: perennial forbs

Other: tall shrubs

Additional: shallow rooted bunchgrasses

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 normal fire frequency 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 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.

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): is 650 pounds per acre (728 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 50-60 percent of the total production, forbs 20-25 percent and shrubs 15-25 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: includes bulbous bluegrass, musk and scotch thistle, and diffuse and spotted knapweed. Cheatgrass can invade the site at the lower elevations.

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