

Ecological site R010XA011ID

Clayey North

16-22 PZ

Last updated: 4/10/2025
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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 9,250 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. 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

Classification relationships

Artemisia arbuscula/ Festuca idahoensis HT. , 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

• Site occurs on uplands • Slopes greater than 30% on northerly aspects • Site occurs in 16-22 PZ • Soils are 20" to bedrock or clay. • Roots do not penetrate below 20" • Restrictive clay layer at 4 to 10 inches

Associated sites

R010XA008ID	North Slope Loamy 16-22 PZ Adjacent north aspects with deeper soils
R010XA010ID	North Slope Fractured 16-22 PZ Adjacent north aspects occurring on fractured bedrock

Similar sites

R010XA008ID	North Slope Loamy 16-22 PZ Deeper soils
R010XA010ID	North Slope Fractured 16-22 PZ Occurring on fractured bedrock, roots penetrate beyond 20

Table 1. Dominant plant species

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

Physiographic features

This site occurs on mountain sides on secondary ridges. Slopes are north and east facing. Slopes range from 30 to 60 percent. The elevation ranges from 5500 to 8200 feet (1620 to 2485 meters).

Table 2. Representative physiographic features

Landforms	(1) Mountains > Ridge (2) Mountains > Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,680 – 2,500 m
Slope	30 – 60 %
Ponding depth	0 cm
Water table depth	200 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 are very gravelly silt loams to an unfractured bedrock at less than 20 inches deep or clay loams that are moderately deep. The clay soils have a restrictive clay layer at 4 to 10 inches. This layer can prevent water and root penetration. The underlying material is metasedimentary sandstone, limestone, or conglomerate. The water intake and internal movement is moderate to slow. Permeability is very slow with the available water holding capacity (AWC) very low to low. Erosion hazard is moderate to high depending on the surface texture when plant cover is lacking.

Table 4. Representative soil features

Parent material	(1) Colluvium – latite (2) Residuum – quartzite (3) Loess – welded tuff
Surface texture	(1) Very gravelly clay loam (2) Loam (3) Sandy loam

Family particle size	(1) Fine
Drainage class	Well drained
Permeability class	Very slow to moderately rapid
Depth to restrictive layer	10 – 30 cm
Soil depth	30 – 100 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	10 – 30 %
Available water capacity (0-101.6cm)	1.78 – 9.91 cm
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 7.8
Subsurface fragment volume <=3" (10.2-152.4cm)	10 – 60 %
Subsurface fragment volume >3" (10.2-152.4cm)	10 – 60 %

Ecological dynamics

Ecological Dynamics of the Site:

The dominant visual aspect of this site is low sagebrush and Idaho fescue. Composition by weight is approximately 40 to 50 percent grasses, 20 to 25 percent forbs and 25 to 35 percent shrubs.

During the last few thousand years, this site has evolved in an arid climate characterized by cool, dry summers and cold, wet winters. Herbivory has historically occurred on the site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, sage grouse, lagomorphs, and small rodents.

Fire has historically occurred on this site every 80 to 100 years. Fire occurs only in years with above normal precipitation.

The Reference State 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 suited for grazing by livestock in spring, early summer, and fall. It also provides habitat for mule deer, pronghorn antelope, small game, sage grouse, small birds, and rodents. The site provides limited recreational opportunities but does provide early spring flower observation.

This site can be degraded easily by improper grazing management since slopes are moderate to steep and relatively low in production, although steep slopes can limit livestock access. Relatively low production on the site makes it susceptible to accelerated degradation from soil erosion. Infiltration and production can be maintained with a mixed stand of deep-rooted perennial bunchgrasses and shrubs. Runoff potential is medium to rapid and the erosion hazard is generally moderate.

Impacts on the Plant Community.

Influence of fire:

This site historically had a very low fire frequency, approximately every 80 to 100 years. Most of the shrubs evolved in the absence of fire therefore they can be severely damaged when burned. Idaho fescue and Thurber's needlegrass in the plant community can be lost with fire. Rabbitbrush species can increase with fire. Cheatgrass and medusahead can be troublesome invaders on this site after a fire, preventing perennial grass and shrub re-establishment. If this occurs it typically will increase the fire frequency. Sandberg bluegrass is usually maintained in the community.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be detrimental to this site. This type of management leads to reduced vigor of Idaho fescue, bluebunch wheatgrass and other deep-rooted perennial bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in low sagebrush and invasive species.

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 can also keep fine fuels from developing, thereby reducing fire frequency. A planned grazing system can 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 and/or medusahead which can lead to more frequent fire intervals.

Weather influence:

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

Influence of Insects and disease:

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

Influence of noxious and invasive plants:

Annual and perennial invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory. Cheatgrass and medusahead can be very invasive species on this site, especially after fire. Once they become established the fire frequency increases. As a result, the shrub component can be lost.

Influence of wildlife:

Relatively low numbers of wildlife use this site and have little impact on it. Pronghorn antelope is the dominant large herbivore using the site. They use the site yearlong but prefer it in the spring, fall, and early winter. Sage grouse use the site for strutting grounds and they may use the site during the winter. Winter and spring use by mule deer occasionally occurs.

Watershed:

Decreased infiltration and increased runoff occur when low sagebrush is removed with frequent fires, particularly the year following the fire event. The increased runoff also increases sheet and rill erosion. The long-term effect is a transition to a different state. When

hydrologic condition of the vegetative cover is good, natural erosion hazard is slight.

Practice Limitations:

Moderate limitations exist for implementing vegetative management practices due to slopes. Early spring grazing should be avoided due to prolonged wetness in the soil. Moderate limitations exist for implementing facilitating practices on this site. Shallow and stony soils and slopes greater than 30% present severe limitations for range seeding by ground moving equipment and is not generally economically feasible due to relatively low production potential.

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				252-454	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	140-252	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	34-84	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	17-34	–
	sedge	CAREX	<i>Carex</i>	0-22	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	1-22	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	11-22	–
Forb					
2				140-252	
	lupine	LUPIN	<i>Lupinus</i>	45-84	–
	beardtongue	PENST	<i>Penstemon</i>	17-34	–
	phlox	PHLOX	<i>Phlox</i>	17-34	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	17-34	–
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	0-22	–
	milkvetch	ASTRA	<i>Astragalus</i>	0-11	–
	pale agoseris	AGGL	<i>Agoseris glauca</i>	0-11	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0-11	–
	fleabane	ERIGE2	<i>Erigeron</i>	0-11	–
	rockcress	ARABI2	<i>Arabis</i>	0-6	–
Shrub/Vine					
3	Shrubs			168-303	
	little sagebrush	ARAR8	<i>Artemisia arbuscula</i>	168-280	–
	Lake Louise arnica	ARLO8	<i>Arnica louiseana</i>	0-22	–
	arrowleaf buckwheat	ERCO12	<i>Eriogonum compositum</i>	0-22	–
	sulphur-flower buckwheat	ERUM	<i>Eriogonum umbellatum</i>	0-22	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-11	–

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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Table 9. Community 3.1 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 rangeland habitat 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 low vertical structure of sagebrush, high elevation and associated cold temperatures throughout much of the year. Sage-grouse an area sensitive species, may utilize the low sagebrush plant community as winter, breeding, nesting and brood-rearing habitat. 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. Water features are sparse provided by seasonal streams, artificial water catchments and springs.

State 1 Phase 1.1 – Low 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. Development of spring sites that collect all available water would exclude amphibian use on these sites. Native shrub-steppe obligate avian species utilizing the habitat include the Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Area sensitive species include sage-grouse which utilize the low sagebrush for winter habitat. Sage-grouse may utilize this plant community for brood-rearing, breeding and nesting habitat. The plant community provides limited seasonal forage needs for large mammals including mule deer, antelope, 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 the low height and density of available sagebrush. State 1 Phase 1.2- Bluebunch Wheatgrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure for animals. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators. The reptiles, 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 collect all available water would exclude amphibian use 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 when adjacent sagebrush cover is provided. Use as winter cover and winter food by sage-grouse is eliminated. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer, antelope, and elk) use would be seasonal and offer little thermal cover and young of year cover. Small mammal diversity would be reduced and the plant community would not provide suitable habitat for pygmy rabbit. State 1 Phase 1.3 – Low Sagebrush/ Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. Native insects assist in pollination but the reduced herbaceous understory results in less diversity and numbers of insects. The reduction of grasses and forbs in the plant community would reduce the available prey species and cover for the resident reptile species. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collect all available water would exclude amphibian use 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 less 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 a shorter duration of seasonal food habitat for mule deer, antelope, 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. State 2 - Sandberg Bluegrass / Cheatgrass / Medusahead Plant Community: This plant community is the result of continued improper grazing management and/or frequent fire. The plant community does not support a diverse insect community. The reduced forb and shrub 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. State 3 - Low Sagebrush/ Sandberg Bluegrass / Cheatgrass / Medusahead Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush comes at the expense of a sparse herbaceous understory dominated by invasive plant species. Native insect populations and diversity are severely reduced. The reptile population is reduced and

represented by leopard lizard, short horned lizard and sagebrush lizard. The reduction of native grasses and forbs in the plant community would reduce the available prey species and cover for these resident reptile species. Key shrub-steppe avian obligates include Brewer's sparrow, sage sparrow, sage thrasher and sage- grouse. Their use of these areas will be reduced. Critical habitat (winter cover and winter food) for sage grouse is available. The plant community supports a short duration seasonal food habitat for large mammals including mule deer, antelope, 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 Grazing Interpretations. This site is suited for grazing by livestock in spring, early summer, and fall. Early spring grazing should be avoided due to prolonged wetness in the soil. 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 C and D.

Recreational uses

Colorful spring and early summer blooming forbs provide excellent opportunities for photography and nature study. Hunting opportunities for pronghorn antelope and sage grouse exist.

Wood products

None

Other products

None

Other information

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, Rangeland Management Specialist, IASCD Joe May, State Rangeland Management Specialist, NRCS, Idaho Lee Brooks, Range Management Specialist, IASCD

Inventory data references

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References

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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

Approval

Kirt Walstad, 4/10/2025

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.

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Date	03/27/2007
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 a wildfire or high intensity storm. Rills are most likely to occur on soils with silt loam or clay loam surface texture.

- 2. Presence of water flow patterns:** Water-Flow Patterns: can occur on this site. When they do occur they are short and disrupted by cool season grasses, shrubs and surface stones. They are not extensive.

- 3. Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes: pedestals are common on the site especially where flow patterns are present and the surface soils have a high clay content. Do not mistake frost heaving for pedestalling. Terracettes can occur above bunchgrasses and shrubs.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):
Bare Ground:is expected to range from 40-50 percent.

5. Number of gullies and erosion associated with gullies: Gullies: none

6. Extent of wind scoured, blowouts and/or depositional areas: Wind-Scoured, Blowouts, and/or Deposition Areas: usually not present in the Reference State.

7. Amount of litter movement (describe size and distance expected to travel): Litter Movement. fine litter in the interspaces may move up to 3 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): Soil Surface Resistance to Erosion: values should range from 4 to 6.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Soil Surface Loss or Degradation: the A or A1 horizon is typically 4 to 8 inches thick. Structure ranges from weak fine granular to strong fine subangular blocky. Soil organic matter (SOM) ranges from 1 to 4 percent.

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

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): Compaction Layer: not present. The site can develop a compaction layer due to the clay in the subsoil from severe livestock use when the soils are wet.

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: Functional/ Structural Groups: cool season deep-rooted perennial bunchgrasses>> medium shrubs>perennial forbs>shallow rooted bunchgrasses.

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
Plant Mortality/ Decadence: very little mortality or decadence is expected on this site. Mortality of shallow rooted grasses may occur due to extended periods of drought.
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14. **Average percent litter cover (%) and depth (in):** Litter Amount: additional data is needed but is expected to be low and at a shallow depth.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
Annual Production: is 700 pounds per acre (784 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 40-50 percent of the total production, forbs 20-25 percent and shrubs 25-35 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: Invasive Plants: include cheatgrass, medusahead wildrye, Vulpia species, bulbous bluegrass, annual mustards, and rush skeletonweed.**
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17. **Perennial plant reproductive capability: Reproductive Capability of Perennial Plants: all functional groups have the potential to reproduce in favorable years.**
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