

Ecological site R048AA245CO Mountain Swale Gunnison Basin LRU

Last updated: 3/11/2025
Accessed: 05/11/2025

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	07/27/2018
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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** No rills present. Very minor rill development may occur in sparsely vegetated areas. If rills were present, they likely would be widely spaced and not connected. Rill development may increase following large storm events, but the site should begin to heal during the following growing season. Frost heaving will accelerate recovery. Rill development may increase when run-in enters the site from adjacent areas that produce large amounts of runoff (i.e., steeper sites, rock outcroppings). The site is essentially level, and rills do not form.
- 2. Presence of water flow patterns:** Vegetation should be persistent in the channel. Flow patterns meander around rocks, litter, and perennial plant bases. They should exhibit only minor evidence of deposition. This site is periodically inundated with runoff water due to its physiographic location.
- 3. Number and height of erosional pedestals or terracettes:** Plants may have small pedestals (<1 inch) in areas adjacent to water flow patterns, but they do not have exposed roots. Terracettes should be few in number and small (3 to 6 inches). They are stable and exhibit little evidence of active erosion. Some plants may appear to have a pedestal as a result of litter accumulating and soil collecting at the base of the plants. This appearance of a pedestal is not the result of erosion.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect <10 percent bare ground. Herbaceous communities are most likely to have less bare ground. As the species composition of shrubs increases, the amount of bare ground likely will increase. Very few, if any, bare spaces of more than 1 square foot are present. Sagebrush invasion commonly causes decreased ground cover; thus, it is an indicator of declining health. Keeping vegetation and litter on the soil surface is key to maintaining the functioning ecosystem.
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5. **Number of gullies and erosion associated with gullies:** None; however, one main ephemeral channel may be present. If present, the channel should be highly mobile and exhibit little entrenchment and sinuousness. If influences offsite cause gullying to begin or continue, it is an indication that the site cannot stop the erosion and is in an unhealthy condition.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** No evidence of active wind-generated soil movement. Wind-scoured areas (blowouts) and depositional areas are very rare. If present, they have muted features and are mostly stabilized by vegetation or a biological crust.
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7. **Amount of litter movement (describe size and distance expected to travel):** Most litter remains in place, but some redistribution is caused by water and wind movement. Very minor movement of litter may occur in flow patterns and rills with deposition at points of obstruction and plant bases. During major flooding, this site slows water and captures litter and sediment; thus, large amounts of litter movement are uncommon.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** The stability class rating expected to range from 2 to 6. Commonly, the soil surface is not very stable because of frequent deposition and weak soil formation. Litter and vegetation maintain the stability of the soil. This site should have a soil stability rating of 5 or 6 under a canopy of plants.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The soils are deep and moderately well drained or well drained. The surface layer is fine-loamy, and it has granular structure. A thick, dark surface layer that is high in content of organic matter (mollic epipedon) is standard in a functioning site. The soils in areas that have never been degraded or drained by gullies may have multiple buried A horizons to a depth of more than 60 inches. The soils in areas where degradation has occurred may have a drastically reduced A horizon (7 inches or less).
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Because this site is on alluvial bottoms, drainageways, and flood plains, it accumulates runoff minimize the impact of raindrops, slow overland flow, and allow for increased infiltration. When perennial grasses decrease in abundance, which reduces the ground cover and increases the amount of bare ground, runoff is expected to increase and infiltration to decrease.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Naturally occurring soil horizons may be harder than the surface, but they should not be considered compaction layers.

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: Dominant Native Perennial Bunchgrass >= Subdominant Native Perennial Bunchgrasses > Subdominant Native Perennial Rhizomatous >= Occasional Native Perennial Cool Season Bunchgrass >>

Sub-dominant: Dominant Native Perennial Forbs >> Subdominant Native Re-Sprouting Shrubs >= Dominant Native Non-sprouting Shrubs >= Subdominant Perennial Cool Season Grass-likes

Other: > Occasional Native Cool non-sprouting Shrubs >= Occasional Native Perennial Forbs

Additional: Rhizomatous grasses and bunchgrasses tend to be equally prominent in patches throughout the site. Rushes are also a fairly major component and should be considered subdominant. Shrubs and forbs combined make up about 10 to 15 percent of the production. Sedges may be present, but a water table commonly is not present during the growing season to support them; thus, they are a minor component.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** During years of average or above-average precipitation, very little recent mortality or decadence should be apparent in the shrubs and grasses. Some mortality of bunchgrasses and other shrubs may occur during a very severe (long-term) drought. Partial mortality of individual bunchgrasses and shrubs may occur during a less severe drought.

14. **Average percent litter cover (%) and depth (in):** Litter cover includes the litter under the plant canopy. Most is fine litter. Excess litter may accumulate in the absence of disturbances. Vegetative production may be reduced if the litter cover exceeds 40 percent. Litter may be reduced during a drought.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 2,000 pounds per acre in low precipitation years; 2,500 pounds per acre in average precipitation years; and 3,000 pounds per acre in above-average precipitation years. After extended drought, production may be reduced by 500 to 1,000 pounds per acre or more.

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:** Kentucky bluegrass, Canada thistle, and dandelion

17. **Perennial plant reproductive capability:** All plants have the ability to reproduce. Limitations may be related to weather, wildfire, natural disease, interspecies competition, wildlife, excessive litter, and insects. Any of these limitations might temporarily reduce the reproductive capability of plants.
