

Ecological site R025XY412UT Mountain Gravelly Loam (Mountain Big Sagebrush)

Accessed: 05/13/2025

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)	Shane A. Green (NRCS), Robert D. Stager (BLM), Brock Benson (NRCS), Mike Gates (BLM), Tyler Staggs (BLM), Alan Bass (BLM). Revised to include updated terminology and concepts by V. Keith Wadman (NRCS Retired)
Contact for lead author	shane.green@ut.usda.gov
Date	01/10/2013
Approved by	Shane A. Green
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** None to very rare. Any rills present should be somewhat short in length (less than 6 feet long), less than 1 inch deep, and occur mostly on areas with increased runoff on the lower parts of steeper slopes, and areas below exposed bedrock. They should be somewhat widely spaced (10-12 feet). Old rills present should be weathered and muted in appearance. An increase in rill formation may be seen after disturbance events such as recent fire or episodic thunderstorms (for example, 100 year storms).
- Presence of water flow patterns:** None to few. A very few flow patterns wind around perennial plant bases and may show slight evidence of erosion. They are expected to be short (3-6 feet), stable, sinuous and not connected. There is usually very minor evidence of deposition. Evidence of flow will increase slightly with slope.
- Number and height of erosional pedestals or terracettes:** Perennial vegetation shows little evidence of erosional pedestalling (1 to 2% of individual plants). Plant roots are covered and litter remains in place around plant crowns. Terracettes should be very few and stable. A slight increase in both pedestal and terracette development may occur with increasing slope.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not**

bare ground): 5 – 15%. The soil surface may have large rocks throughout with 30 to 60 percent rock fragments. Bare ground openings should not be greater than 1 foot in diameter.

5. **Number of gullies and erosion associated with gullies:** No gullies present on site. A very few gullies may be present in landscape settings where they transport runoff from areas of greater water flow such as exposed bedrock. These gullies will be limited to slopes exceeding 20% and adjacent to sites where this runoff accumulation occurs. Any gullies present should show little sign of accelerated erosion and should be stabilized with perennial vegetation.
-
6. **Extent of wind scoured, blowouts and/or depositional areas:** None. No evidence of wind generated soil movement is evident. Wind caused blowouts and deposition are not present.
-
7. **Amount of litter movement (describe size and distance expected to travel):** Most litter resides in place with some redistribution caused by water movement. Minor litter removal may occur in flow channels with deposition occurring within 1 to 2 feet at points of obstruction. The majority of litter accumulates at the base of plants. Some grass leaves and small twigs (grass stems) may accumulate in soil depressions adjacent to plants. Woody stems are not likely to move. However, some litter movement is expected (up to 6 feet) with increases in slopes >15% and/or increased runoff resulting from heavy thunderstorms.
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** This site should have a soil stability rating of 5 or 6 under the plant canopies, and a rating of 4 to 5 in the interspaces. The average should be a 5. Surface texture is gravelly silt loam to cobbly loam. Vegetation cover, litter and/or surface rock reduce erosion.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Parkay) Soil surface horizon is 0 to 12 inches deep. Texture is a gravelly loam. Structure is moderate medium granular. Color is black (7.5YR 2/1). Mollic epipedon ranges to 30 inches deep. Use the specific information for the soil you are assessing found in the published soil survey to supplement this description.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial vegetation produces sufficient cover and spatial arrangement to intercept raindrops and reduce raindrop splash erosion. Litter on soil surface and condition of soil surface also protect soil from splash erosion and encourage a high rate of infiltration. Plant spatial distribution should slow runoff allowing additional time for infiltration. Bare spaces are expected to be small (< 1 foot) and irregular in shape and are usually not connected. The vegetative structure is usually adequate to capture snow and ensure snowmelt occurs in a subdued manner allowing maximum time for infiltration and reduce runoff and erosion in all but the most extreme storm events (for example, 100 year storm). When perennial grasses and shrubs decrease, reducing ground cover and increasing bare ground, runoff is expected to increase and any associated infiltration reduced.
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Some soils may have an argillic horizon that could be mistaken for a compaction pan.
-

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: Perennial bunchgrasses (Idaho fescue, basin wildrye), = > Non-sprouting shrub (mountain big sagebrush, antelope bitterbrush), >> Sprouting shrubs (mountain snowberry, green rabbitbrush, rubber rabbitbrush).

Sub-dominant: Rhizomatous grasses (slender wheatgrass) > Perennial forbs (arrowleaf balsamroot).

Other: Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

Additional: Disturbance regime includes fire, drought, and insects. Assumed fire cycle of 60-90 years.

Dominance is based on average annual production, air dry weight: Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species in the reference state. Following a recent disturbance such as drought, fire or insects that remove the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community for a time. If a disturbance has not occurred for an extended period of time, woody species may continue to increase, reducing the perennial herbaceous understory species. These conditions would normally reflect functional community phases within the reference state.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All age classes of perennial grasses should be present under average to above average growing conditions with age class expression likely subdued in below average growing conditions, or on sites with high (usually greater than 65%) similarity index (late seral to historic climax). Slight decadence in the principle shrubs could occur near the end of the fire cycle or during periods of extended drought, or insect infestations. In general, a mix of age classes may be expected with some dead and decadent plants present.

14. **Average percent litter cover (%) and depth (in):** Litter cover will be heavier under plants. Most litter will be herbaceous and depths of 1 to 2 inch would be considered normal. Perennial vegetation should be well distributed on the site.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production in air-dry herbage should be approximately 1750 - 1850 #/acre on an average year but could range from 925 - 2250 #/acre during periods of prolonged drought or above average precipitation.

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:** Cheatgrass, alyssum, Russian thistle, Utah juniper, other non-native grasses and forbs.

17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce in all years, except in extreme drought years. Green rabbitbrush and mountain snowberry sprout vigorously following fire. There are no restrictions on either seed or vegetative reproduction. Some seedling recruitment of major species is present during average and above average growing years.
