

## **Ecological site R035XY243UT Semidesert Stony Loam (Blackbrush)**

Accessed: 05/20/2025

---

### **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)	V. Keith Wadman (NRCS Ret.), Fee Busby (USU), Dana Truman (NRCS), Paul Curtis (BLM), Shane A. Green (NRCS), Robert Stager (BLM). Revised to include new concepts and terminology by V. Keith Wadman.
Contact for lead author	Shane.Green@ut.usda.gov
Date	09/05/2014
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### **Indicators**

- 1. Number and extent of rills:** None to very few rills present. Some very minor rill development may occur on steeper slopes or on areas located below exposed bedrock or other water shedding areas where increased runoff may occur. Any rills present should be <1 inch deep, fairly short (<8 feet long) and somewhat widely spaced (6-8 feet). Minor rill development may be observed following major thunderstorm or spring runoff events but should heal during the next growing season.
-

2. **Presence of water flow patterns:** Very few sinuous flow patterns wind around perennial plants and surface rock. Evidence of flow patterns is expected to increase somewhat with increased slope. Water flow patterns are long (15-20 feet), narrow (<1 foot wide), and spaced widely (10-20 yards) on gentle slopes (<15%) and more closely (<10 yards) on steeper slopes.

---

3. **Number and height of erosional pedestals or terracettes:** Small pedestals may form at the base of plants that occur on the edge of water flow patterns, but should not show any exposed roots. Terracettes are fairly common, forming behind debris dams of small to medium sized litter (up to 2 inches in diameter) in water flow patterns. These debris dams may accumulate smaller litter (leaves, grass and forb stems) and sediment.

---

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20–30%. (Soil surface is typically has 25 to 50% surface fragments). Most bare ground is associated with water flow patterns, rills, and gullies. Poorly developed biological soil crusts that are interpreted as functioning as bare ground (therefore they would be susceptible to raindrop splash erosion) should be recorded as bare ground. Ground cover is based on first raindrop impact, and bare ground is the opposite of ground cover.

---

5. **Number of gullies and erosion associated with gullies:** None to very few. Some gullies may be present in landscape settings where increased runoff may accumulate (such as areas below exposed bedrock). Such gully development is expected to be limited to sites adjacent to areas where 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:** No evidence of wind generated soil movement. Wind caused blowouts and depositions are not expected to be 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 patterns and rills with deposition occurring 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 not likely to move.

---

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 to 6 under the plant canopies using the soil stability kit test, and a rating of 4 to 5 in the interspaces. The average should be a 5. Surface textures are silty clay loams clays. Vegetation cover, litter, and biological soil crusts reduce erosion.
- 

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Moab) Soil surface horizon is 0-3 inches deep. Structure is weak fine granular. Color is brown (7.5YR-5/4). There is little if any difference under canopy or in interspaces and a recognizable A horizon is expected to be present throughout. 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:** Bare spaces are small and rounded in shape and are usually not connected, perennial grasses, sagebrush, and biological soil crusts (where present) are usually distributed in sufficient density to intercept raindrops, increase surface detention of water, to increase infiltration and reduce erosive energy of runoff. When perennial grasses decrease, reducing ground cover and increasing bare ground, runoff would be expected to increase and associated infiltration would be reduced. A reduction in vegetative structure can reduce snow capture.
- 

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 have increase in clay content at 3 to 9 inches and that should not be mistaken for a compaction layer. Naturally occurring hard layer (i.e., calcic horizons) should not be considered as 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: Non-sprouting shrubs (Blackbrush) > Perennial bunchgrasses (Indian ricegrass) > Rhizomatous grasses (James galleta).

Sub-dominant: Sprouting shrubs (Mormon tea, fourwing saltbush) > Perennial bunchgrasses (bottlebrush squirreltail) > Rhizomatous grasses (blue grama).

Other: Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species in the reference state (e.g. Crested wheatgrass, Intermediate wheatgrass, Small burnet, etc.)

Additional: Disturbance regime includes infrequent fire, insects, and drought. Biological soil crust is variable in its expression where present on this site and is measured as a component of ground cover.

Following a recent disturbance such as fire, drought, or insects that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community. These conditions would reflect a functional community phase within the reference state. The perennial grass and non-sprouting shrub functional groups are expected on this site. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

- 
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 under below average 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. 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 (including under plants) nearly all of which should be fine litter. Depth should be 1/4 inch thickness in the interspaces and up to 1/2 inch under shrub canopies. Litter cover may increase to 30% on some years due to increased production of plants.
- 

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 300 - 750#/acre on an average year, but could range from 200 to 1000#/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: Invasive species capable of dominating this site include cheatgrass, Russian thistle and mustard species.
- 

17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce in all years, except in extreme drought years. 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.
-