

Ecological site R035XY101UT Desert Alkali Sandy Loam (Alkali Sacaton)

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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), Dana Truman (NRCS), Paul Curtis (BLM) Randy Beckstrand (BLM)
Contact for lead author	shane.green@ut.usda.gov
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Approved by	Shane A. Green
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Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills increase immediately following large storm events but should not persist more than one or two winters due to frost-heave recovery and coarse soil textures. There should be very few on slopes < 6%. On slopes >6%, rills may be 5-10 feet in length. Rills are most likely to form below adjacent exposed bedrock or water flow patterns where sufficient water accumulates to cause erosion.

2. **Presence of water flow patterns:** There should be few and short (3-6') water flow patterns on low slopes (< 6%), increasing in frequency and length (up to 5-10') with slope. Waterflow patterns may increase on steeper slopes following large storm events, dissipating where the slope flattens. Interspaces between vegetation and/or well developed biological soil crusts appear to be depression water storage areas but actually serve as somewhat stable water flow patterns during precipitation events.

3. **Number and height of erosional pedestals or terracettes:** Plants that occur on the edge of water flow patterns and rills on steeper slopes (>6%) may be slightly pedestalled, but there should be no exposed roots. Terracettes are few, occurring behind litter obstructions in water flow patterns. Well developed biological crusts may appear pedestalled, but are actually a characteristic of the crust formation.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 40 – 65%. (Soil surface is typically covered by 0 to 5 percent surface fragments). Ground cover is based on the first raindrop impact, and bare ground is the inverse of ground cover. Ground cover + bare ground = 100%. Any

well developed biological crusts present should not be recorded as bare ground. 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.

5. **Number of gullies and erosion associated with gullies:** No active gullies. Some stable 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 slopes exceeding 15% and adjacent to sites where runoff accumulation occurs. Any gullies present should show little sign of accelerated erosion and should be stabilized with perennial vegetation and biological soil crusts.

6. **Extent of wind scoured, blowouts and/or depositional areas:** There should be very little evidence of active wind scoured, blowout or depositional areas.

7. **Amount of litter movement (describe size and distance expected to travel):** There may be movement of fine litter on low slopes (< 6%) of up 2-4'. On steeper slopes, fine litter may be redistributed in waterflow patterns following large storm events, depositing where the slope flattens or behind obstructions. Woody litter (if present) should not move from beneath the plant.

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 an soil stability rating of 4 or 5 under plant canopies and a rating of 4 in the interspaces using the soil stability test kit. The average rating should be a 4. Surface texture ranges from silt loam to loamy fine sand. Vegetation cover, litter accumulation, surface rock and biological soil crusts reduce erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface horizon is typically 3 to 7 inches deep. Structure is typically moderate thin platy to moderate medium platy. Color is typically brown to (7.5YR5/4) to yellowish red (5YR5/6). 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:** Vascular plants and/or any well developed biological soil crusts will break raindrop impact and splash erosion. Spatial distribution of vascular plants and interspaces between well developed biological soil crusts (where present) provide detention storage and surface roughness that slows runoff allowing time for infiltration. Interspaces between plants and any well developed biological soil crusts may serve as water flow patterns during episodic runoff events, with natural erosion expected in severe storms. When perennial grasses 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. The presence of moderate thin platy to moderate medium platy structure on this site should not be confused with 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: Warm season perennial grasses (Alkali sacaton, Galleta, Blue grama) > sprouting shrubs (greasewood, rabbitbrush)

Sub-dominant: Non-sprouting shrubs (shadscale, winterfat fourwing saltbush) > Cool season perennial bunchgrasses (Indian ricegrass) > perennial and annual native forbs > Biological soil crusts

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, Smooth brome, Intermediate wheatgrass, Siberian wheatgrass and/or forage kochia etc.) Biological soil crust is variable in its expression where present on this site and is measured as a component of ground cover.

Forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

Additional: Following a recent disturbance such as fire, drought or insects that remove the woody vegetation, forbs and perennial grasses (herbaceous species) may become more dominant in the community. These conditions reflect a community phase within the reference state.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** During years with average to above-average precipitation, there should be very little recent mortality or decadence apparent in either the shrubs or grasses. During severe (multi-year) drought up to 20% of the plants may die. Some mortality of bunchgrass and other shrubs may also occur during severe droughts, particularly on the coarser soils associated with this site. There may be partial mortality of individual bunchgrasses and other shrubs during less severe drought.

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 leaf thickness in the interspaces and up to ¼" under canopies. Litter cover may increase up to 10% immediately following leaf drop. Litter redistribution following natural extreme runoff events can reduce litter cover by concentrating it in low-lying areas. Litter cover may increase to 7-12% following seasons with above average production due to a high production of annuals.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 400-450 #/acre on an average year

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, Russian thistle and other introduced annual forbs.

17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce sexually or asexually in most years, except in drought years.

