

Ecological site R035XY125UT Desert Shallow Clay (Shadscale)

Accessed: 05/21/2025

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), Dana Truman (NRCS), Paul Curtis (BLM) and Randy Beckstrand (BLM)
Contact for lead author	shane.green@ut.usda.gov This site is in the early stages of soil formation
Date	09/10/2008
Approved by	Shane A. Green
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Very common. Rills present should be 15 or more feet long. They should be 2-3 inches deep.

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2. **Presence of water flow patterns:** Very common throughout the site. They are expected to be long and connected into drainage networks. Evidence of flow will increase with slope.
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3. **Number and height of erosional pedestals or terracettes:** Plants may show some pedestalling (up to .5 inch) on their down slope side. Terracettes should be few and stable. Interspaces between well developed biological soil crusts may resemble pedestals but they are actually a characteristic of the crust formation.
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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 30 – 50%. Ground cover is based on the first raindrop impact, and bare ground is the inverse of ground cover. Ground cover + bare ground = 100%. 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.
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5. **Number of gullies and erosion associated with gullies:** Few. May be found where adjacent sites/watershed provide concentrated flows into the site. Gullies should show only minor signs of active erosion and should be mostly stabilized with perennial vegetation. Gullies may show slightly more indication of erosion as slope steepens, or as the site occurs adjacent to sites where runoff accumulation occurs.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** No evidence of wind generated soil movement. Wind caused blowouts and deposition are not expected to be present.
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7. **Amount of litter movement (describe size and distance expected to travel):** Some down slope redistribution caused by water. Some litter removal may occur in flow patterns or rills with deposition occurring at points of obstruction, especially following major storm events. Litter movement will increase with slope.
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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):** This site should have a soil stability rating of 4 under plant canopies and a rating of 2 to 3 in the interspaces using the soil stability kit test. The average should be a 3. Surface texture is clay loam. Vegetation cover, litter, biological soil crusts and surface rock reduce erosion.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface horizon is typically 4 inches deep. Structure is typically moderate fine granular. Color is typically reddish brown (5YR5/4). The A horizon would be expected to be more strongly developed under plant canopies. It is important if you are sampling to observe the A horizon under plant canopies as well as the interspaces. 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 are expected to break raindrop impact and splash erosion reducing the amount of splash erosion but not eliminating it. Spatial distribution of vascular plants slows runoff somewhat by obstructing surface flows to help create sinuous flow patterns that dissipate energy and allow time for some infiltration. Natural erosion would be expected in most storms and spring runoff.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. The higher clay content and 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: Non-sprouting shrubs (Shadscale)

Sub-dominant: Warm season perennial grasses (Galleta) > Perennial bunchgrasses (Indian ricegrass) > perennial and annual native forbs (Indian pipeweed) > 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. Siberian Wheatgrass, Forage kochia etc.)

Biological soil crust is variable in it's 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: Factors that cause temporal variability include drought and insects. Factors that

cause spatial variability include slope and aspect, etc.

Following a recent disturbance such as drought or insects that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate 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 near average or above average precipitation, there should be very little recent plant mortality and decadence in either the shrubs or grasses. During severe (multi year) drought, many of the Shadscale plants will die. Some mortality of perennial grass and other shrubs may also occur during severe droughts. There may be partial mortality of individual grasses and shrubs during less severe drought. Shadscale may appear dead during droughts, but is actually in a dormant stage with partial leaf shedding.

14. **Average percent litter cover (%) and depth (in):** Mostly shadscale leaves. Litter cover (including under plants) 5-10% nearly all of which should be fine litter. Depth should be 1 leaf thickness in the interspaces and 1/8 inch under shadscale canopies.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 150-200 #/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:** Russian thistle, halogeton, 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.
