

Ecological site R034BY109UT Desert Loamy Clay (Shadscale)

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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.

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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Rills are somewhat common. They may be more pronounced on steeper slopes and/or on areas located below exposed bedrock, or other water shedding areas where increased runoff may occur. Rills present should be < 2 inches deep, fairly long (> 15 feet) and somewhat widely spaced (8-10 feet). On steeper slopes, rills may be 20 to 25+ feet long and spaced 6 to 8 feet apart. The expression of rills may be less defined where coarse fragments (i.e., gravels and/or channers) dominate the soil surface.

- 2. Presence of water flow patterns:** Water flow patterns are somewhat common throughout the site. They often form sinuous flow patterns that wind around perennial plants and surface rock. Evidence of flow patterns is expected to increase somewhat with slopes greater than 15%. Water flow patterns are long (15-20 feet), narrow (1 to 2 feet wide), and spaced widely (10-20 yards) on gentle slopes (<15%) and more closely (<10 yards) on steeper slopes (>15%).

- 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 1 inch) 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):** 45–50%. (Soil surface is typically covered by up to 35% surface fragments). Most bare ground is associated with water flow patterns, rills, and gullies. Bare ground spaces should not be greater than 2 to 3 feet and may

be connected. Poorly developed biological soil crusts that are interpreted as functioning as bare ground should be recorded as bare ground.

5. **Number of gullies and erosion associated with gullies:** Rare on slopes < 15%. A few widely scattered gullies will be expected to occur on steeper slopes and on areas below exposed bedrock. Where they do occur, their length often extends from the exposed bedrock to where the gully reaches a stream or other area where water and sediment accumulate. Gullies may show slightly more indication of erosion as slope increases, or as the site occurs adjacent to steep sites/watershed with concentrated flow patterns.
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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):** Most litter resides in place with some redistribution caused by water movement. Some litter removal may occur in flow channels with deposition occurring within 2 to 3 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 4 feet) with increases in slopes > 15% and/or increased runoff resulting from heavy thunderstorms.
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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 or 5 under plant canopies and a rating of 2 or 3 in the interspaces. The average should be a 3 or 4. Surface texture is silty 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):** (Persayo) Soil surface horizon is typically 0 to 4 inches deep. Texture is a silty clay loam, structure is moderate fine granular. Color is a yellowish brown (2.5YR 6/3). An ochric horizon extends 4 inches into the soil profile. Use the specific information for the soil you are assessing found in the published soil survey to supplement this description.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial vegetation is expected to break raindrop impact and splash erosion reducing splash erosion but not eliminating it. Spatial distribution of vascular plants slows runoff somewhat by obstructing surface flows and 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.
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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. Shale or siltstone bedrock occurs at about 14 to 24 inches.
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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, bud sagebrush) > Cool season perennial bunchgrasses (bottlebrush)

squirreltail, Indian ricegrass) > Rhizomatous grasses (James galleta) > Perennial forbs (scarlet globemallow) > Biological soil crusts.

Sub-dominant: Sprouting shrubs (winterfat, green rabbitbrush) > Perennial bunchgrasses (Salina wildrye, Sand dropseed) > Perennial forbs (Shockley wild buckwheat).

Other: 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: Moss and lichen communities will normally be found under plant canopies while the cyanobacteria may be found throughout the site. Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

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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 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 or insect infestations, up to 20% of the winterfat may die. There may be partial mortality of individual bunchgrasses and shrubs during severe drought.
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14. **Average percent litter cover (%) and depth (in):** Litter cover ranges from 10 to 20%. Depth should vary from none to a 1 leaf thickness in the interspaces and from 1/4 - 1/2 inches under perennial plant canopies.
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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 250 to 300 pounds per acre on an average year. Production could vary from 100 to 400 pounds per acre during drought or above-average years.
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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, kochia, common sunflower, and annual mustards.
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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 should be present during average and above average growing years.
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