

## **Ecological site R030XY110UT Desert Loam (Creosotebush)**

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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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Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

1. **Number and extent of rills:** No rills present. Very minor rill development may occur in sparsely vegetated areas. If rills are present, they should be widely spaced and not connected. Rill development may increase following large storm events, but should begin to heal during the following growing season. Frost heaving will accelerate recovery. Rill development may increase when run inflow enters site from adjacent sites that produce large amounts of runoff (i.e. steeper sites, slickrock, rock outcrop). Site is essentially level and rills do not form.

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2. **Presence of water flow patterns:** Water flow patterns will be very short (1-3'), narrow (<1'), and meandering; interrupted by plants and exposed rocks. Slight to no evidence of erosion or deposition associated with flow patterns. Where slopes exceed 5%, water flow patterns may be of medium length (5 –10 feet).

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3. **Number and height of erosional pedestals or terracettes:** The occurrence of pedestals or terracettes in the reference state is rare; however small pedestals (1-3") of bunch grasses and shrubs may occur. This is due to natural wind erosion and redistribution of surface soil. Some plants may appear to have a pedestal but rather than be formed by erosion, they are the result of litter and soil accumulating at plant bases, forming the appearance of a pedestal. Well-developed biological crusts may appear pedestalled, but are actually a characteristic of the crust formation. Some plants may appear to have a pedestal but rather than be formed by erosion, they are the result of litter and soil accumulating at plant bases, forming the appearance of a pedestal.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 30-45% bare ground (soil with no protection from raindrop impact). Very few if any bare spaces of greater than 1 square foot. In general, bare ground increases as production decreases. As species composition of shrubs relative to grasses increases, bare ground is likely to increase. Poorly developed biological soil crust that is susceptible to erosion from raindrop impact should be recorded as bare ground.
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5. **Number of gullies and erosion associated with gullies:** No gullies present.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very small areas (less than 4 square feet) may be present. Slight depositional mounding occurs at plant bases. Wind scour or deposition areas may be associated with fire activity.
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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 and wind movement. Very minor litter removal may occur in water flow paths with deposition occurring at points of obstruction. Where litter movement does occur, litter accumulates at plant bases. Some leaves, stems, and small twigs may accumulate in soil depressions adjacent to plants. Woody stems are not likely to move.
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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 an erosion rating of 3 to 5 under plant canopies and a rating of 2 to 3 in the interspaces with an average rating of 3 using the soil stability kit test.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Ap--0 to 9 inches; light brown (7.5YR 6/4) silt loam; reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, very friable, slightly sticky, slightly plastic; common fine, few medium and coarse roots; strongly effervescent, lime is disseminated; moderately alkaline (pH 8.0); diffuse smooth boundary. (3 to 15 inches thick)
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses and shrubs are equally important for increasing infiltration and reducing runoff. Plant litter and canopy cover from all functional groups intercept rainfall and prevent splash erosion. Bunchgrasses contribute organic matter directly to soil through root decay, and organic matter helps stabilize soil aggregates and maintain soil porosity. Shrubs hold snow and slow wind evaporation. Bunchgrass bases intercept litter and soil in water flow paths, reducing runoff. Biological soil crusts (where present) are resistant to raindrop impact and splash erosion. Spatial distribution of vascular plants and well-developed biological soil crusts (where present) provides detention storage and surface roughness that slows runoff allowing time for infiltration. Interspaces between plants and any well-developed biological soil crusts (where present) may serve as water flow patterns during episodic runoff events, with natural erosion expected in severe storms.
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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):** A compaction layer is not expected.
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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: Dominant: Shrubs (creosote bush, Nevada jointfir, burrowbush) = perennial warm-season bunchgrasses (big galleta, sand dropseed, mesa dropseed) > perennial cool-season bunchgrasses (Indian ricegrass, red brome)

Sub-dominant:

Other: Other: Other perennial grasses = other shrubs > perennial forbs

Additional:

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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. Some mortality of bunchgrass and other shrubs may occur during very severe (long-term) droughts. Long-lived species dominate the site. Open spaces from disturbance are quickly filled by new plants through seedlings and asexual reproduction (tillering).

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14. **Average percent litter cover (%) and depth ( in):** Litter cover includes litter under plants. Most litter will be fine (herbaceous) litter. Almost all litter is concentrated under plant canopies. Litter between plant canopies is very sparse. Average litter cover is 5-15% and average litter depth is 0.25-0.5 inches.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 450-550 lbs/acre.  
Even the most stable communities exhibit a range of production values. Production will vary between communities and across the MRLA. Refer to the community descriptions in the ESD. Production will differ across the MLRA due to the naturally occurring variability in weather, soils, and aspect. The biological processes on this site are complex; therefore, representative values are presented in a land management context.

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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:** Cheatgrass, halogeton, kochia, Russian thistle

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17. **Perennial plant reproductive capability:** Reproduction restricted by effective precipitation, rock cover, soil depth, and generally harsh growing conditions; all to be expected for site. Site provides harsh environment for seedling establishment.

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