

Ecological site R035XY122UT Desert Shallow Loam (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

- Number and extent of rills:** A. On more gentle slopes (< 10 %): A few rills occur throughout the site. Rills may be 8 or more feet in length but may become longer as slope increases. Rills are most likely to form below adjacent exposed bedrock or where water flow patterns converge and sufficient water accumulates to cause erosion. Rills will be more apparent immediately following large storm events. B. On steeper slopes (> 10 %): Some rills occur throughout the site. Rills may be 15 or more feet in length but may become longer as slope increases. Rills will be more apparent immediately following large storm events.
- Presence of water flow patterns:** Frequent and occur throughout the site. Interspaces between well developed biological soil crusts appear to be depression water storage areas but actually direct the water flow patterns across areas covered with biological soil crust during high intensity precipitation events. Evidence of flow will increase with slope. Water flow patterns are somewhat sinuous and wind around perennial plant bases and rocks. They are long (>20 feet), narrow (<6 inches), and not widely spaced (5-15 feet), and often converge creating drainage networks.
- Number and height of erosional pedestals or terracettes:** Minor pedestalling may form at the base of plants as a result of natural wind or water erosion, occurring more frequently near water flow patterns. Exposed roots are very rare. Terracettes are rare and occur behind debris dams in water flow patterns. Well developed biological crusts may appear pedestalled, but this is actually a characteristic of the crust formation.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not**

bare ground): 20 – 50%. (Soil surface is typically covered by up to 60 percent rock or caliche fragments). Ground cover is based on the first raindrop impact, and bare ground is the inverse of ground cover. Ground cover + bare ground = 100%.

5. **Number of gullies and erosion associated with gullies:** Present. May be found where adjacent sites or watersheds provide concentrated flows into the site. Gullies should show only minor signs of active erosion and should be mostly stabilized with perennial vegetation and/or rock fragments. Gullies may show slightly more indication of erosion as slope increases, or as the site occurs adjacent to steep sites or watersheds with concentrated flow patterns. Gullies are limited in depth by the shallow bedrock.

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.

7. **Amount of litter movement (describe size and distance expected to travel):** Some down slope redistribution caused by water. Some fine litter removal may occur in flow patterns with deposition occurring at points of obstruction, especially following major storm events. Litter movement will increase with slope.

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 to 5 under plant canopies and a rating of 3 to 4 in the interspaces using the soil stability test kit, depending on soil texture and structure, which can vary widely on this ecological site. Surface texture ranges from gravelly fine sandy loam to channery loam to gravelly clay loam. 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 up to 3 inches deep. Structure may be vesicular and from weak thin platy parting to moderate very fine subangular blocky to moderate fine granular. Color varies from light red (2.5YR6/6), to dark reddish brown (2.5YR 3/4) to pale yellow (5Y 7/3) to light yellowish brown (10YR6/4). 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:** Distribution of vascular plants and biological soil crusts are expected to intercept raindrops reducing splash erosion. Plants and biological soil crusts are usually distributed in sufficient density to slow runoff allowing time for infiltration. Natural erosion would be expected in severe thunder storms or heavy spring runoff. 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 platy to subangular blocky structure and/or shallowness 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) = Cool season perennial bunchgrasses (Indian ricegrass) > sprouting shrubs (mormontea) > perennial and annual native forbs (globemallow) > 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 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: Factors that contribute to temporal variability include drought, insects, and very infrequent fire. Factors that contribute to spatial variability include soil textures, rock fragment content, slope, and aspect.

Following a recent disturbance such as drought or insects that remove the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community. In very rare instances, fire may cause the disturbance. These conditions would reflect a functional 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.
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14. **Average percent litter cover (%) and depth (in):** Mostly shadscale leaves and seed. Litter cover (including under plants) 0-5% nearly all of which should be fine litter. Depth should be 1 leaf thickness in the interspaces and up to 1/4" under canopies. Litter cover may increase to 3-10% on some years due to increased production of plants.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 225-250 #/acre on an average year.
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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, Russian thistle, halogeton, and other introduced annual forbs.
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17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce sexually or asexually in most years, except in drought years.
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