

## **Ecological site R028AY320UT Upland Shallow Hardpan (Pinyon-Utah Juniper)**

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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:** Some rills present. 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 other sites that produce large amounts of runoff (i.e. steeper sites, slickrock, rock outcrop).

2. **Presence of water flow patterns:** Water flow patterns will be short (2-5') and meandering; interrupted by plants and exposed rocks. Some evidence of erosion or deposition associated with flow patterns. Where slopes exceed 5%, water flow patterns may be longer (5-10').

3. **Number and height of erosional pedestals or terracettes:** Plants may have small pedestals (1-3") where they are adjacent to water flow patterns, but without exposed roots. Terracettes should be few and stable. Terracettes should be small (1-3") and show little sign of active erosion. Some plants may appear to have a pedestal but rather than be formed by erosion, the only place litter accumulates and soil collects is 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, the only place litter accumulates and soil collects is at plant bases forming the appearance of a pedestal.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not**

**bare ground):** 20-40% bare ground (soil with no protection from raindrop impact). Herbaceous communities are most likely to have lower values. As species composition by shrubs increases, bare ground is likely to increase. Poorly developed biological soil crust that is susceptible to raindrop splash erosion should be recorded as bare ground. Very few if any bare spaces of greater than 1 square foot.

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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 minor evidence of active wind-generated soil movement. Wind scoured (blowouts) and depositional areas are rarely present. If present they have muted features and are mostly stabilized with vegetation and/or biological crust. Gravel or desert pavement protects the site from wind scour.
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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 flow patterns and rills with deposition occurring at points of obstruction. The majority of litter accumulates at the base of plants. 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 5 or 6 under plant canopies and a rating of 4 to 5 in the interspaces with an average rating of 5 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):** This description is based on a combination of the 4 correlated soils for this site. This results in variation of each of these attributes. Due to the natural variability of soil attributes, it is critical to supplement this description with the soil-specific information from the published soil survey.
- Soil surface horizon is typically 7 to 14 inches deep. Structure is typically moderate fine or weak medium granular. Color is typically brown (10YR 5/3) or grayish brown (10YR 5/2), dark brown (10YR 3/3) or very dark grayish brown (10YR 3/2) moist. Mollic epipedon is common.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Vascular plants and any well-developed biological soil crusts (where present) 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. Crowns of trees and accumulating litter at base of trees appear to create a micro-topography that may enhance development of water flow patterns below the drip line of the canopy. Significant increases in pinyon-juniper canopy reduces understory vegetation and increases 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. Naturally occurring soil horizons may be harder than the surface because of an accumulation of clay or calcium carbonate and should not be considered as compaction layers. A duripan (indurated layer of illuvial silica and lime) may be present

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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: black sagebrush > Indian ricegrass, bluebunch wheatgrass, singleleaf pinyon

Sub-dominant: Wyoming big sagebrush, Mexican cliffrose, antelope bitterbrush

Other: other grasses, other shrubs, forbs

Additional: In the northern portion of the MLRA cool-season perennial grasses (Indian ricegrass, needle and thread) dominate. In the southernmost portion of the MLRA warm-season perennial grasses (galleta, sand dropseed) dominate. The two groups share dominance in the middle portion of the MLRA.

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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 bunchgrass and shrub mortality may occur during severe droughts, particularly on the shallower and coarser soils associated with this site.

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14. **Average percent litter cover (%) and depth ( in):** Litter cover includes litter under plants. Most litter will be fine litter. Depth should be 1-2 leaf thickness in the interspaces and up to 1/2" under canopies. Litter cover may increase to 20-30% following years with favorable growing conditions. Excess litter may accumulate in absence of disturbance. Vegetative production may be reduced if litter cover exceeds 40%.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 700#/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 and annual forbs

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17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce sexually or asexually, except in drought years. Density of plants indicates that plants reproduce at level sufficient to fill available resource. Within capability of site there are no restrictions on seed or vegetative reproductive capacity.

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