

Ecological site R035XY315UT Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3

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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.

Author(s)/participant(s)	Robert Stager (BLM), Dana Truman (NRCS), V. Keith Wadman (NRCS Ret.), Paul Curtis (BLM), Shane A. Green (NRCS), Randy Beckstrand (BLM)
Contact for lead author	
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Approved by	Shane A. Green
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Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** One steeper slopes (>10): Rills are long and common. On more gentle slopes (< 10 %): Rills are few, but occur throughout site. Rills may be 6 to 10 feet in length. Sides of rills may be up to 3 inches high. Rills are most likely to form below adjacent exposed bedrock or water flow patterns where sufficient water accumulates to cause erosion. B. On steep slopes (> 12 %): Common. Occur throughout the site. Rills may extend down entire slope.

2. **Presence of water flow patterns:** Frequent and occur throughout area. Interspaces between well developed biological soil crusts appear to be water depression storage areas but actually serve as water flow patterns across areas covered with biological soil crust during episodic precipitation events. Evidence of flow will increase somewhat with slope.

3. **Number and height of erosional pedestals or terracettes:** Pedestals form at the base of plants that occur on the edge of rills. On steep slopes (>12%), gullies may remove soil from the base of trees exposing roots that resemble pedestals. Interspaces between well developed biological soil crusts resemble pedestals and may be up to 2 inches high. Terracettes are present. Some debris dams of small to medium sized litter (up to 2 inches in diameter) may form in water flow patterns, rills, and gullies. These debris dams may accumulate smaller litter (leaves, grass and forb stems).

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 6 – 16 %. Most bare ground is associated with water flow patterns, rills, and gullies. The soil surface is covered by up to 54% rock fragments. Areas with well developed biological soil crusts should not be counted as bare ground. 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. Ground cover is based on first raindrop impact, and bare ground is the opposite of ground cover. Ground cover + bare ground = 100%.

5. **Number of gullies and erosion associated with gullies:** None to few on gentle slopes (< 10 %). On steep slopes and areas below adjacent exposed bedrock, gullies may be numerous. Length often extends from exposed bedrock until gully reaches a stream or an area where water and sediment accumulate. Gullies may remove soil from base of trees exposing roots.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None to very few. Trees break the wind and reduce the potential for wind erosion.

7. **Amount of litter movement (describe size and distance expected to travel):** On gentle slopes (< 10 %) most litter accumulates at base of plants. Woody stems from trees not moved unless present in water flow pattern, rill, or gully. On steep slopes (> 20 %), woody stems may be washed from site. Gullies may remove accumulated litter from under trees.

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 the plant canopies, and a rating of 2 to 4 in the interspaces. The average should be a 4. Vegetation cover, litter, biological soil crusts and surface rock reduce erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface varies from 1 to 2 inches. Structure is medium platy. Color is light red (2.5YR6/6). There is little if any difference under canopy or in interspaces and a recognizable A horizon is expected to be present throughout. Refer to soil survey for more detailed information about your specific site.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Spatial distribution of well developed biological soil crusts (where present) intercept raindrops reducing splash erosion and provide areas of surface detention to store water allowing additional 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 (beyond the reference state) reduces understory vegetation causing an associated increase in runoff.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None, although bedrock is found within 20 inches of soil surface. In addition, there may be layers of calcium carbonate or other naturally occurring hard layers found in the soil subsurface. These should not be considered to be 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: Dominance by average annual production: Shrubs >> Trees (Pinion > Juniper) > cool season perennial grasses > warm season perennial grasses > forbs. 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. Crested wheatgrass, Intermediate wheatgrass, etc.)

Sub-dominant: galleta, Mormontea, Indian ricegrass, Nevada bluegrass. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

Other:

Additional: Biological soil crust is variable in its expression where present on this site and is measured as a component of ground cover.

Following a recent disturbance such as fire, drought, or insects that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community. If a disturbance has not occurred for an extended period of time, woody species may continue to increase crowding out the perennial herbaceous understory species. In either case, 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):** Several standing dead trees may be present on the site and approximately 30 % of the trees can show evidence of decadence. All age classes of perennial grasses should be present under average growing condition with a decrease in age class expression under below average conditions, or on sites with high (usually greater than 65%) similarity index (late seral to historic climax). In drought tree mortality may increase with the first sign being a yellowish to reddish leaf color.
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14. **Average percent litter cover (%) and depth (in):** Litter cover 12-24%. Variability may occur due to weather.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 500-890lbs/acre
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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 introduced annual forbs are likely to invade this site.
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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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