

Ecological site R036XY307UT Upland Loam (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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Approved by	Shane A. Green
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** Rills are rarely found on this site. Any rills present should be short in length (less than 6 feet long) and only occur on lower part of steeper slopes, below exposed bedrock, or within microtopography commonly found on this site. Old rills should be weathered and muted in appearance. An increase in rill formation may be seen after disturbance events such as recent fire or heavy thunderstorms.

 - Presence of water flow patterns:** The presence of water flow patterns is common. Flow patterns occur in low places associated with microtopography commonly occurring on the site. They are long (more than 30 feet), and spaced about 20-30 yards apart.

 - Number and height of erosional pedestals or terracettes:** Plants should show little or no pedestaling. There should be no exposed roots. A few terracettes may occur on behind litter dams in water flow patterns.

 - Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground in the reference state is expected to range from 15-35%. Much of the area is covered with well developed biological crusts which should not be recorded as bare ground; however there are some areas of weakly developed biological crusts that may function as bare ground (raindrop splash, runoff, etc.) and should be recorded as such. Bare ground is measured based on first raindrop impact, cover + bare ground = 100%.
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5. **Number of gullies and erosion associated with gullies:** Gullies should not occur on this site in the reference state. There may be rare gullies present caused by run on water from adjacent sites such as exposed bed rock, small watersheds or dissected slopes.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very minor evidence of wind generated soil movement may be barely discernible. Wind caused blowouts and depositions are not apparent.
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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 and wind. Fine litter (<1/4 inch in diameter) movement usually occurs in water flow patterns, with deposition occurring at obstruction. The majority of litter accumulates at the base of plants or in soil depressions adjacent to the plant. Woody stems (those greater than 1/4 inch in diameter) are not likely to move under normal conditions
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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 5 throughout the site using the soil stability test kit. Surface textures are sandy loams. This site, in the reference condition, is resistant to erosion.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface is 2-3 inches deep and structure is typically described as weak fine granular. The A-horizon color is a dark yellowish brown (10YR4/4). The A-horizon would be expected to be more strongly developed under plant canopies. It is important if you are sampling to observe the A-horizon under plant canopies as well as in the interspaces. 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:** The presence of perennial cool and warm season grasses, shrubs, trees, and well developed biological crusts (moss, pinnacled lichen, etc.) are distributed to intercept raindrops, increase surface detention of water, increase infiltration, and reduce erosive energy of runoff. Configuration of tree crowns and litter accumulation under crowns may form a micro-topography that may accumulate water for more rapid runoff, particularly if bare soil lies below the outer edge of the canopy.
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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 on this site. Some soils may have increase in clay content at 3 to 9 inches that could be mistaken for a compaction layer. Naturally occurring layers of hard calcium carbonate may also be found in the soils, but should not be considered a compaction layer.
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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: 340-550 lbs/acre from perennial warm and cool season grasses (e.g. Indian ricegrass, needleandthread, blue grama, and galleta)
- 100-500 lbs/acre from trees (e.g. Utah juniper and pinyon)

100-350 lbs/acre from shrubs (e.g. basin big sagebrush, winterfat, and green mormontea)

Sub-dominant: 50-100 lbs/acre from native perennial and annual forbs

Other: Other forbs, shrubs, and grasses. Developed biological crusts are common, but do not necessarily drive the ecological dynamics for this ecological site.

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Mix of young, medium aged, and old pinyon and Utah juniper are expected to be found on this site, in plant community 1.1; old pinyon and Utah juniper and expected in community 1.2; and young pinyon and Utah juniper are expected in community 1.4. During years with average to above average precipitation, there should be very little mortality or decadence apparent in either shrubs or grasses, except in a case where insect infestation has occurred. Slight decadence in the principle shrubs and trees may occur near the end of the fire cycle.
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14. **Average percent litter cover (%) and depth (in):** Litter cover (not including under plants) ranges from 5-10%. Most litter, however, accumulates below and to the side of live plants, and thus percent litter will be just slightly above percent canopy cover. Typically litter under shrubs is 1 leaf thickness, but is expected to increase during drought, when shrubs experience leaf drop. Litter under trees may be up to 1 inch deep.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 800-1100 lbs per acre in 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:** ": Known invasive species include cheatgrass (*Bromus tectorum*), broom snakeweed (*Gutierrezia sarothrae*), tansy mustard (*Descurainia pinnata*), annual stickseed (*Lappula* sp.), annual *Cryptantha* (*Cryptantha* sp.), and Russian thistle (*Salsola tragus*).
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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.
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18. **Supporting Data:** NRCS (Dana Truman) 2006 ESD data from Natural Bridges National Monument
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