USDA Natural Resources
Conservation Service

Ecological site R025XY324UT
Upland Shallow Loam (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:** Few. Rills should be 1 to 2 inch deep, up to 5 inches wide, and may extend down the entire slope.

2. **Presence of water flow patterns:** Water flow patterns are frequent and occur throughout the site. Some exposed roots may be found around perennial plant bases. There is some evidence of current erosion. Flows may extend down the entire slope. There may some evidence of deposition where slope ends.

3. **Number and height of erosional pedestals or terracettes:** Pedestals form at the base of 20-40% perennial vegetation. Terracettes are not common. Debris dams of small to medium sized litter (up to 2 inches in diameter) may form in water flow patterns and rills. 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):** 20-60% bare ground. Soil surface is typically covered by approximately 35% coarse fragments. Bare ground spaces may be connected and are mostly associated with waterflow patterns, rills and gullies.

5. **Number of gullies and erosion associated with gullies:** Gullies may be present. Length often extends the length of the slope cutting down to exposed tuffaceous sandstone parent material (sandstone which contains volcanic ash). The gullies are usually wide and shallow and armored with exposed parent material and some vegetation. Gullies may remove soil from the base of trees exposing roots.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None.

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter is moved with even moderate precipitation events and spring runoff, accumulating down slope behind plants and rock features in the site and onto adjacent sites. Woody stems may be washed from site. Gullies may remove accumulated litter from under trees.

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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 3 or 4 under the plant canopies using the soil stability kit test, and a rating of 2 to 4 in the interspaces. The average should be a 3. Surface texture is gravelly sandy loam. Vegetation cover, litter and/or surface rock reduce erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Codquin) Soil surface horizon is 4 inches deep. Structure is single grain. Color is white (2.5YR8/2). An ochric epipedon (light or bleached color) is 4 inches and comprises the A horizon, especially under the tree canopies. 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:** This site has low vegetative cover with up to 60 percent bare ground. While limited juniper and understory shrubs, grasses and forbs are present and provide some erosion protection, the steepness and bareness of the slope are expected to allow some natural erosion to occur even in minor 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):** None. Tuffaceous sandstone is typically found at 17 inches and is not 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: Trees (Utah juniper) > Non-sprouting shrubs (Wyoming big sagebrush, bitterbrush) > Perennial bunchgrasses (bluebunch wheatgrass, Indian ricegrass).

    Sub-dominant: Sprouting shrubs (Saskatoon serviceberry, green rabbitbrush) > Perennial forbs (arrowleaf balsamroot).

    Other: Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

    Additional: Disturbance regime includes parasites, insects, drought, and very infrequent fire (100 or more years). 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, Pubecent wheatgrass, Siberian Wheatgrass etc.) 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.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** The plant community is made up of young, mid, and old aged juniper trees (seedling to 400+ years old) perennial grasses and shrubs. Standing dead trees may be present on the site and approximately 5-20 % of the trees can show evidence of decadence. All age classes of perennial grasses should be present under average to above average growing conditions with age class expression likely subdued during below average years or on sites with a high (usually greater than 65%) similarity index (late seral to historic climax). In drought and/or insect/fungus infestations, juniper 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 may only occur under perennial vegetation. Most litter will be herbaceous and depths of 0 to 1/4 inch would be considered normal. Perennial vegetation should be well distributed on the site.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production in air-dry herbage should be approximately 150 - 250#/acre on an average year, but could range from 50 to 400#/acre during periods of prolonged drought or above average precipitation.

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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, non-native, invasive forbs such as alyssum.

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17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce in most years, except in extreme drought years. Some seedling recruitment of major species should be present during average and above average growing years.
