USDA Natural Resources
Conservation Service

Ecological site R035XY234UT
Semidesert Shallow Shale (Utah Juniper-Pinyon)

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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:** Rill development is constrained on this site due to the extremely high component of surface rock fragments. None to very rare rills are expected.

2. **Presence of water flow patterns:** Water flow patterns are subtle and difficult to interpret due to the extremely high component of surface rock fragments. They may occur in the interspaces between rock framents.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are rare, on steeper slopes plants may appear to have slight pedestaling on the down slope side, but there should be no exposed roots.
   Terracettes are few, occurring in water flow patterns behind debris dams of small to medium sized litter. 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):** 30-50 %. (Soil surface is often covered 50 to 75 sometimes as high as 90% percent surface fragments). 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. Gully formation is impaired due to the shallow soils

and extremely high component of surface rock fragments.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Surface rock reduces the potential for wind erosion.

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7. **Amount of litter movement (describe size and distance expected to travel):** On gentle slopes (< 10 %) most litter accumulates at base of plants or behind terracettes. Woody stems from trees not moved unless present in water flow pattern, rill, or gullies on steeper slopes.

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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 4 or 5 under the plant canopies, and a rating of 3 to 4 in the interspaces. The average should be a 4. Vegetation cover, litter, biological soil crusts and 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):** Soil surface horizon is typically 1 to 2 inches deep. Structure is typically weak medium platy to weak fine granular. Color is typically light yellowish brownish (10YR6/4) to light reddish brown (5YR6\4) to red (2.5YR4/8). 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:** Spatial distribution of plants and well developed biological soil crusts (were present) intercept raindrops reducing splash erosion and provide areas of surface detention to store water allowing additional time for infiltration.

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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, although bedrock is found within 20 inches of soil surface. Some sites have a weak medium platy structure. These should not be considered to be compaction layers.

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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: Non sprouting shrubs (Desert holly, Broom snakeweed, Cliffrose) > Trees (Juniper > Pinyon) > Sprouting shrubs (Mormontea, rabbitbrush) Warm season grassess (Galleta) > Cool season grasses (Indian ricegrass).

    Sub-dominant: Forbs (Brenda’s yellow cryptantha) > 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. Crested wheatgrass and Russian wildrye etc.)

    Additional: Temporal variability is caused by drought, erosion events, and very infrequent fire. Spatial variability is caused by slope, aspect, and rock fragments. Biological soil crust is variable in it’s expression where present on this site and is measured as a component of ground cover. Following a recent disturbance such as fire or drought that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community. These

conditions reflect a functional community phase within the reference state. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Community is made up of young, mid, and old aged juniper and a smaller percentage of pinyon trees (about 1/5th of the trees are expected to be pinion). Several standing dead trees may be present on the site and approximately 30 % of the trees can show evidence of decadence (i.e. dead branches). In drought tree mortality may increase, especially the pinyon trees.

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14. **Average percent litter cover (%) and depth (in):** Litter cover (including litter beneath plant canopies)varies from 5 to 24%

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 235-315 #/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:** Few invasives are capable of dominating this site. Cheatgrass, and annual mustards may invade the community.

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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.
