Ecological site R035XY225UT
Semidesert Shallow Sand (Cutler"s Jointfir)

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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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Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are not present in the reference state on the gentler slopes. Few rills present on slopes exceeding 10% are likely to form below adjacent exposed bedrock or water flow patterns where sufficient water accumulates to cause erosion. Rills present should be small, less than 6 feet in length. The number of rills can increase immediately following large storm events but should not persist more than one or two seasons due to coarse soil textures and frost-heave recovery.

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2. **Presence of water flow patterns:** The occurrence of water flow patterns is rare (0-3% cover) on all slopes in the reference state, and are typically less than 3 feet long. As slopes increase (>10%) water flow pattern occurrence (3-8% cover) and length (3-5ft) also increases. An increase in water flow patterns is also expected after disturbance events such as precipitation events and increased wildlife use, which increases the percent of bare ground and erosion potential.

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3. **Number and height of erosional pedestals or terracettes:** The occurrence of pedestalling or terracetting in the reference state is rare; however 1 inch pedestalling of shrubs is acceptable, but there should be no exposed roots.

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

bare ground): In the reference state bare ground is variable (20-60%) throughout all plant community phases. Bare ground is associated with water flow patterns, rodent activity, and plant interspaces. Areas with poorly developed biological soils crust that are interpreted as functioning as bare ground (therefore they would be susceptible to raindrop splash erosion) should be recorded as bare ground. This site can have up to 5% surface rock cover.

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5. **Number of gullies and erosion associated with gullies:** Active gullies are generally nonexistent; however, stable gullies may occur in landscape settings where increased runoff may have accumulated (such as areas below exposed bedrock). Any gully development is expected to be limited to steeper slopes, show little sign of accelerated erosion, and be stabilized with perennial vegetation.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Some wind generated soil movement is normal. Wind caused blowouts and depositions are mostly small, stable and have healed over. Some coppice mounding around Cutler mormontea, when present is common. Increased wind generated soil movement can occur after severe (multi-year) drought or severe wind events.

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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 (<¼ inch in diameter) may be moved up to 2-3 ft and usually occurs in water flow patterns and rills, 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 .25 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 3-4 throughout the site. Surface texture varies from sand to loamy fine sand. As sites depart from the reference state to a state dominated by invasive annuals soil surfaces textures are expected to have less structure.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Nalcase) Soil surface 0-4 inches deep and structure is single grain. The A-horizon color ranges from a very pale brown (10YR 7/4) to a yellowish brown (10YR 5/6)when moist. Surface textures are typically sands to fine sands. The A-horizon typically exhibits none to very little development. 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 overstory trees, shrubs, and perennial grasses break raindrop impact and splash erosion. The spatial distribution of vascular plants, non-vascular communities (when present), and interspaces provide detention storage and surface roughness that slows down runoff, allowing time for infiltration. When shrubs and perennial grasses decrease, reducing ground cover and increasing bare ground, runoff can increase and infiltration would be reduced.

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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. Soils typically reach bedrock at 8 inches.

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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: Overstory trees (Two-needle pinyon/Utah juniper) > sprouting shrubs (Cutler jointfir > non-sprouting shrubs (Mexican cliffrose/ single-leaf ash) > Perennial grasses (Indian ricegrass/Sandhill muhly/James galleta).

    Sub-dominant: Sprouting shrubs (Rabbitbrush/ Sand sage) = forbs (globemallow, milkvetch) > Biological soil crust.

    Other: Biological soil crust is variable in it's occurrence on this site and when present, is measured as a component of ground cover.
    Forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

    Additional: Temporal variability is caused by drought, insects, large precipitation events, and infrequent spot fire. Spatial variability is caused by soil textures, proximity to runoff producing sites, etc.
    Following a major disturbance such as drought or insects that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may increase in the community. If a disturbance has not occurred for an extended period of time, woody species may continue to increase, competing with the perennial herbaceous understory species. In either case, these conditions reflect a 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):** During years with average to above average precipitation, there should be very little mortality or decadence apparent in either shrubs or grasses. Many plants may die during a multi-year drought. Some (up to 20%) perennial bunch grass mortality is expected during severe drought

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14. **Average percent litter cover (%) and depth (in):** Litter cover (including under plants) ranges from 10-20%, nearly all of which should fine litter. Variability is due to the herbaceous production differences from one year to the next. Depth is generally 1 leaf thickness in the interspaces and up to .25 inch under plant canopies. Litter can increase up to 20% immediate following leaf drop or after favorable conditions increase native annual forb production.

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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 350 - 400 lbs./acre on an average year, but could range from 150 to 600 lbs./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:** Known invasive species include cheatgrass, Russian thistle and redstem storksbill.

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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 during drought.

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18. **Supporting Data::** NRCS (Dana Truman/Ashley Garrelts) 2006/2007 ESD data from Arches and Canyonlands National

Parks.