Ecological site R034BY328CO
Semidesert Clay Loam

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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	Scott Woodall
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None or few. Any rills present are somewhat short (less than 6 feet long) and very shallow, which follows the surface microfeatures. An increase in rill formation may occur after disturbances such as recent fires or thunderstorms in adjacent areas where increased runoff may accumulate (such as areas adjacent to exposed bedrock). Rill development commonly is limited to slopes of more than 20 percent.

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2. **Presence of water flow patterns:** Water flow patterns wind around the base of perennial plants and exhibit little or slight evidence of erosion. They are short, stable, and usually disconnected. There is minor evidence of deposition. In gently sloping areas (less than 10 percent slopes) of the site, visible water flow patterns are infrequent and usually less than 3 feet long. Longer water flow patterns may be on the steeper slopes (more than 20 percent). Numerous small debris dams may be seen after rainfall.

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3. **Number and height of erosional pedestals or terracettes:** Some pedestals and terracettes may be apparent near long-lived perennial plants that are associated with water flow patterns. Pedestals are on the steeper slopes (more than 20 percent) and usually are associated with water flow patterns. Loss of plant cover can result in formation of a well-developed biological crust on the soil. The interspaces between areas that have a crust may resemble pedestals, but they are actually a characteristic of the crust formation.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Commonly, 15 to 30 percent of the ground is bare. Ground cover is based on the first raindrop impact,

and bare ground is the opposite of ground cover. Areas that have a well-developed biological crust on the soil should not be recorded as bare ground. Areas that have a poorly developed biological crust that is interpreted as functioning similar to bare ground (susceptible to raindrop splash erosion) should be recorded as bare ground. Extended drought can increase the extent of bare ground.

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5. **Number of gullies and erosion associated with gullies:** None or few. Some gullies may be in areas where runoff may accumulate (such as adjacent to exposed bedrock). Gully development is expected to be limited to slopes of more than 20 percent and adjacent to sites where runoff accumulates. The gullies should show little sign of accelerated erosion and should be stabilized by perennial vegetation.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very minor evidence of wind-generated soil movement. Wind-scoured (blowouts) and depositional areas are rare.

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7. **Amount of litter movement (describe size and distance expected to travel):** Most litter resides in place, but some redistribution is caused by water movement. Minor removal of litter may occur in flow patterns and rills, and deposition occurs at points of obstruction. A majority of the litter accumulates at the base of plants. Some grass leaves and small twigs (grass stems) may accumulate in depressions of the soil adjacent to plants. Woody stems are not likely to move.

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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):** The surface layer of the soils is silty clay loam, clay loam, or loam. The hazard of water erosion is slight or moderate. The soils have a high resistance to wind erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface layer of the soils is silty clay loam, clay loam, or loam and is 2 to 7 inches thick. Refer to the soil survey for more detailed information about a specific site.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Vascular plants and well-developed biological crusts on the soil will limit the impact of raindrops and splash erosion. Spatial distribution of vascular plants and interspaces between areas of biological crust provide detention storage and surface roughness, which slow runoff and allow time for infiltration. The interspaces between plants and areas of biological crust may serve as water flow patterns during episodic runoff events, and natural erosion is expected in severe storms. When the abundance of perennial grasses decreases, which increases the amount of bare ground, runoff is expected to increase and associated infiltration decrease.

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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. Naturally occurring soil horizons may be harder than the surface layer because of an accumulation of clay (soil texture change) or calcium carbonate; they should not be considered 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: Perennial grasses (squirreltail, saline wildrye, western wheatgrass, galleta) > non-sprouting shrubs (Wyoming big sagebrush)>

Sub-dominant: sprouting shrubs (fourwing saltbush) = forbs

Other:

Additional: 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). Perennial grass/non-sprouting shrub functional groups are expected on this site. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based on departures from average growing conditions. Disturbance regime includes drought, insects, and fire. Assumed fire cycle of 50 to 70 years or more. Following a recent disturbance, such as fire or drought, that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may become dominant in the community. If a disturbance has not occurred for an extended period, woody species may continue to increase and crowd out the perennial herbaceous species in the understory. 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):** All age classes of perennial grasses should be present under average or above-average growing conditions, and age class expression likely is subdued during below-average years. Slight decadence in the principle shrubs could occur near the end of the fire cycle or during and following an extended drought. More decadence of bunchgrasses is expected with a lack of disturbance. In general, a mix of age classes may be expected with some dead and decadent plants present.

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14. **Average percent litter cover (%) and depth (in):** 10 to 20 percent. Variability may occur due to weather. Litter cover declines during and following a drought because the plants are not producing litter.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 500 pounds per acre in low precipitation years, 700 pounds in average precipitation years, and 1,000 pounds in above-average precipitation years. After extended drought or during the first growing season after a wildfire, production may be significantly reduced by 200 to 400 pounds per 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:** Yellow rabbitbrush, cheatgrass, purple threeawn, broom snakeweed, and introduced annual forbs (filaree, Russian thistle, sticktight).

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17. **Perennial plant reproductive capability:** All perennial plants should be able to reproduce sexually or asexually in most years. The only limitations are weather, wildfire, natural diseases, and insects. Yellow rabbitbrush sprouts vigorously following fire.