USDA Natural Resources
Conservation Service

Ecological site R035XB217AZ
Sandy Upland 6-10" p.z.

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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	Byron Lambeth
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** There are none on this site and none are expected due to the high intake potential of these soils and soil surface protection provided by vegetation cover.

2. **Presence of water flow patterns:** Water flow patterns (WFP) are usually hard to distinguish. These soils have high saturated hydraulic conductivity and low to very low runoff and WFP are most apparent immediately after brief intense storm events. These WFP, if present, are less that 5 feet, sinuous and discontinuous.

3. **Number and height of erosional pedestals or terracettes:** Pedestals may occur, but are not common and are less than 1 inch in height. Terracettes are not expected. Some deposition may occur around the base of perennial plants and is not considered erosional.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 35-55% and can very considerably due to the droughty nature of the site. Bare ground may be higher where this site integrades with sand dunes. Drought may cause an increase in bare ground.

5. **Number of gullies and erosion associated with gullies:** None.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind scours and blowouts are not common, due to high herbaceous cover. Blowouts and deposition areas are stable and healed, if present. Some soil deposition may occur around long lived perennial vegetation during prolonged droughts or high wind events.

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine and medium herbaceous litter and fine woody litter will be transported short distances, primarily by wind. In rare occurances, it will be transported in water flow pathways as a result of brief intense strom events. Coarse woody litter will remain under shrub canopies.
Water is not normally a factor in litter movement due to the high rate of infiltration.

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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):** Soil surface textures are loamy sand to sand. These soils have very few rock fragments. Canopy cover can vary considerably due to the droughty nature of the site. Soil Site Stability values from slake test generally range from 2-3 across the site, with higher values resulting from the presence of weak cryptobiotic discontinuos crusts that can develop on the soil surface.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface horizon is generally 2 inches thick with a single grain, loose to granular structure. The color of the A-horizon is not significantly different from the subsurface soil horizons.

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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 is characterized by groups of grasses, shrubs and forbs in descending order. Vegetative cover ranges 25-45% (grasses > shrubs > forbs). Basal cover ranges 6-15% for vascular plants (predominantly grasses)and 1-10% for biological crust (cyanobacteria > lichen > moss). Both canopy and basal cover values decrease during prolonged drought.

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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. Most of the soils are not easily compacted.

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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 warm season sodgrasses > perennial cool season bunchgrasses > perennial warm season bunchgrasses >

    Sub-dominant: shrubs

    Other: perennial forbs > annual forbs and grasses > succulents

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All plant functional groups are adapted to survival in all but the most severe droughts. Severe winter droughts affect shrubs and cool season grasses the most. Severe summer droughts affect warm season grasses the

most. Forbs are affected differently by species depending on their particular life cycle. Observed mortality on perennial grasses and shrubs ranges from 1 to 3 percent.

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14. **Average percent litter cover (%) and depth (in):** Litter cover ranges from 25-45% with an average depth of less than 1/4 inches. Of the litter amount, it would be expected that approximately 70-90% would be herbaceous litter and approximately 10-30% woody litter. Litter amounts increase during the first couple years of drought, then decrease in later years.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Total average annual production in a normal year is about 450 to 550 lbs/ac.

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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:** Broom snakeweed, rubber rabbitbrush, and Cutler's jointfir are native to the site, but have the potential to increase and dominate after heavy continuous grazing. Cheatgrass is an exotic annual grass that has the potential to invade and dominate, with or without disturbance. Russian thistle and shepherd's purse are exotic forbs that have the potential to invade and dominate the site after heavy grazing and/or disturbance, especially if the site is near farm fields or disturbed lands.

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17. **Perennial plant reproductive capability:** All plants native to the site are adapted to the climate and capable of producing seeds, stolons and/or rhizomes except during the most severe droughts.
