USDA Natural Resources
Conservation Service

Ecological site R035XG717AZ
Shallow Loamy 14-18" 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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Date	05/15/2006
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** A few minor rills may form due to loamy textures, slow permeability, shallow depth, and medium to rapid runoff, especially on steeper slopes. Rill formation will be reduced if the soil has a lot of rock fragment armor and/or a large amount of rock fragments in the profile.

2. **Presence of water flow patterns:** Water flow patterns may be common due to slow permeability, shallow depth and medium to rapid runoff. There will be more water flow patterns on steeper areas and in areas with more rock outcrop and/or very shallow (<10") soils.

3. **Number and height of erosional pedestals or terracettes:** Some pedestals and terracettes may form, but they should be very short.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** This site has an average available water capacity of only 2 inches, so the potential to produce plant cover is very low. Bare ground may be as high as 50%. Areas with a greater cover of rock fragments and/or rock outcrop have less bare ground. 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:** None

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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous and fine woody litter will be transported in water flow pathways. Coarse woody litter will remain under shrub and tree canopies. Litter movement may be greater on very shallow soils.

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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 texture is generally fine sandy loam, loam, or clay loam. Most surface horizons contain a significant amount of rock fragments (gravels, channers, flagstones, or stones). Many soils have 10-50% surface cover of rock fragments. Aggregate stability values average 5 under plant canopies, and 4 in the interspaces. Blue grama root mats increase the stability of the soils. When well vegetated or covered with rock armor, the soils have a moderate to high resistance to water erosion and 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):** Surface structure is predominently granular (weak to moderate, very fine or fine to medium) with some areas that are platy (weak, thin or medium or thick) or subangular blocky (weak, fine). Surface thickness ranges from 1-7 inches. Color is variable depending upon parent material.

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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 a relatively uniform distribution of mostly grasses with some shrubs. Some areas have up to 25% canopy of trees. Canopy cover measured in one area was 35% (mostly in grasses). Basal cover of plants measured in one area was 4% (all grasses. The cover (especially basal cover) is reduced by the amount of rock fragment and/or bedrock ground cover. Both canopy and basal cover values (especially canopy cover) decrease during a prolonged drought. This type of plant community is moderately effective at capturing and storing precipitation.

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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. Due to loamy surface textures, the soils may be easily compacted in at least part of the surface 10 inches unless there is a large amount of rock fragment armor on the surface or within the surface horizons. Some of the soils have a naturally platy surface structure.

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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: none

    Sub-dominant: Cool season bunchgrasses = warm season bunchgrasses > shrubs >

    Other: Minor: warm season colonizing grasses = trees >
    Trace: forbs = cacti

    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 years except during the most severe droughts. Severe winter droughts affect shrubs and trees the most. Severe summer droughts affect grasses the most. Very shallow (<10") woils will show the most mortality in all functional groups.

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14. **Average percent litter cover (%) and depth (in):** Mostly herbaceous litter with some woody litter. Litter amounts increase during the first few 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):** 600-650 pounds (dry weight) per acre in drought years, 650-825 pounds per acre in median years, 825-950 pounds per acre in wet years.

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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, pricklypear cactus, and cholla cactus are native to the site, but have the potential to increase and dominate the area after heavy grazing. Utah juniper, oneseed juniper, and Colorado pinyon are native to the site, but should generally comprise less than 25% canopy cover. Heavy grazing and fire exclusion can sometimes cause these trees to dominate the area.

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