USDA Natural Resources
Conservation Service

Ecological site R035XB228AZ
Sandstone Upland 6-10" p.z. Sodic

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

Indicators

1. **Number and extent of rills:** A few rills may occur on this site and should be less than 15 feet in length. On steeper slopes, rills may increase in length and numbers. There may be an increase in rills following large storm events.

2. **Presence of water flow patterns:** The water flow patterns are widely spaced and uniform, the average length is 10-20 feet long with up to 10% coverage across the site. Flow paths should be less than 12 inches wide. Where present the flow paths should be somewhat sinuous and winding around plant bases and rock fragments.

3. **Number and height of erosional pedestals or terracettes:** Only very few low terracettes along water flow patterns. There is some slight mounding (less than 1 inch) around long-lived perennial grasses and shrubs. There can be some slight pedestalling along or near water flow patterns. There should be no exposed roots on herbaceous plants and rarely on shrubs.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground range from 30-50 percent.

5. **Number of gullies and erosion associated with gullies:** None to rare, but can occur where adjacent sandstone breaks and rock outcrops that can concentrate on-site water flow. When present, gullies should be very shallow and show only minor signs of active erosion and stabilized with perennial vegetation and/or rock fragments.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None expected, due to loamy textures and amount of rock cover on surface. There is some slight mounding occurring around the bases of shrubs.

7. **Amount of litter movement (describe size and distance expected to travel):** The majority of the fine herbaceous litter (<1/8") are moved by wind and water in flow paths, and only woody litter remains and accumulate under the shrubs.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability with canopy ranges from 4 to 5 and with no canopy ranges from 2 to 3 in the interspaces.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is moderate (weak, thick) platy structure parting to weak fine granular, the color is typically light reddish brown-5YR 6/4, and surface thickness ranges from 2 to 3 inches. Color can vary depending on parent material. Additional soil information can be accessed through the soil survey report for the soil you are evaluating.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The site is dominated by grasses and makes up the majority of the plant composition (60%) and along with rock fragments help reduce splash erosion and slow runoff. However, the lack of good herbaceous perennial cover and moderate bare ground cover limits the sites ability to effectively capture and hold runoff.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Some soils may have a natric horizon within 8 inches of the surface or platy structure and should not be confused with compaction layers.

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: Warm season grasses (alkali sacaton, galleta, sand dropseed) > Low shrubs (Shadscale, mound saltbush, broom snakeweed, Jimmyweed) >>

    Sub-dominant: Cool season grasses (Indian ricegrass, squirreltail, threeawn) > forbs >

    Other: Annual grasses = Cacti

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Prolonged droughts can affects shrubs and cool season grasses especially if there are insufficient winter moisture. On this site, there is a 5-10% decadence in shrubs and succulents species.

14. **Average percent litter cover (%) and depth (in):** Litter depth will range from a thickness of 1 leaf to ¼ inch.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** The site has an expected annual production of about 175-225 lbs/ac during normal years.

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:** Mound saltbush is native to the site, but has the potential to become the dominant species. Snakeweed is also a native species but also has the ability to increase and dominate a site after heavy grazing. Introduced annuals such as cheatgrass and Russian thistle have the ability to increase and co-dominate the site after heavy continuous grazing or disturbance.

17. **Perennial plant reproductive capability:** The only natural limitations to reproductive capability are weather related and natural disease or herbivory that reduces reproductive capability. All plants native to this site are adapted to the climate and are capable of producing seeds, stolons, and/or rhizomes except during the most severe droughts.