**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**: None

2. **Presence of water flow patterns**: Typically none. If present, are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers.

3. **Number and height of erosional pedestals or terracettes**: There is no evidence of pedestaled plants or terracettes or the site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground)**: 5% or less bare ground, with bare patches ranging from 3-5 inches in diameter. Prolonged drought or wildfire events will cause bare ground to increase upwards to 5-10% with bare patches ranging from 8-12 inches in diameter.

5. **Number of gullies and erosion associated with gullies**: None
6. **Extent of wind scoured, blowouts and/or depositional areas**: Minor wind scouring may occur on knolls. Wind erosion can occur with disturbances such as wildfire or extended drought.

7. **Amount of litter movement (describe size and distance expected to travel)**: Litter should be uniformly distributed with little movement. On steep slopes or knolls, litter may move from a few inches to 1-2 feet depending on intensity of wind/rainfall event.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values)**: Stability class rating anticipated to be 2-3 in interspaces at soil surface.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness)**: SOM ranges from 2-4%. A-horizon ranges from 0-7 inches. Soils are very deep, very dark brown (10YR 2/2) moist; loamy sand; weak fine granular structure;

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff**: Diverse grass, forb, shrub canopy and root structure reduces raindrop impact and slows overland flow providing increased time for infiltration to occur. Extended drought and/or wildfire may reduce canopy cover and litter amounts resulting in decreased infiltration and increased runoff on slopes of 15-25%.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site)**: None

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**: Tall and mid warm season grasses 65%--sand bluestem >> prairie or giant sandreed = swithgrass > Indiangrass = little bluestem

   **Sub-dominant**: Group2 grasses 10% needleandthread = blue grama = sand lovegrass > sidoats grama > sand dropseed > composite dropseed = western wheatgrass

   **Other**: Group3 grasses Minor 5%. Forbs and legumes Sub-dominant 10% and Shrubs Sub-dominant at 10%

   **Additional**: See functional and structural group sheet for specific forbs and shrubs.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence)**: The majority of plants are alive and vigorous. Some mortality and decadence is expected for the site. This in part is due to drought, unexpected wildfire or a combination of the two events. This would be expected for both dominant and sub-dominant groups.

14. **Average percent litter cover (%) and depth (in)**: 40-65% litter cover at 0.25-0.50 inch depth. Litter cover during and
following drought can range from 25-35% and 5-15% following wildfire.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1000 lbs./ac. low precip years, 2000 lbs./ac. average precip years, 3000 lbs./ac. high precip years. After extended drought or the first growing season following wildfire, production may be significantly reduced by 400 – 750 lbs./ac. or more.

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: Invasive plants should not occur in reference plant community. Following wildfire or extended drought, cheatgrass, Russian thistle, kochia, Rocky Mountain beeplant will invade assuming a seed source is available. Blue grama and sand sagebrush are the major native (non-invasive) increasers on this site.

17. **Perennial plant reproductive capability:** The only limitations are weather-related, wildfire, natural disease, and insects that may temporarily reduce reproductive capability.