USDA Natural Resources
Conservation Service

Ecological site R035XA101AZ
Breaks 10-14" 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	Steve Barker
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Numerous well defined rills on areas with less than 40% rock and gravel. Number and extent of rills increase with slope steepness and length.

2. **Presence of water flow patterns:** Many well developed WFP around perennial plants and boulders. Increase flow patterns with a decreased in rock fragment cover.

3. **Number and height of erosional pedestals or terracettes:** Numerous well developed pedestals (1 – 3” high) around perennial plants and smaller boulders. Some terracettes form

in less steep WFPs.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20 to 50% bare ground depending on rock and gravel cover.

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5. **Number of gullies and erosion associated with gullies:** Gullies can occur in less rocky and deeper soil areas. Many small gullies and gully like formations on toe slopes. There are numerous large drainages on this site that are stable and lined with bedrock.

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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):** Most herbaceous and fine woody litter will be transported by wind and in water flow pathways, while a small percentage stays in place. Coarse woody litter and duff will accumulate under shrub canopies.

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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 resistance to erosion varies greatly depending on vegetative cover as well the distribution of rock, boulders and/or gravel. In areas of no vegetative cover or rock armoring, the surface erodes readily.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** No A horizon in plant inter spaces, surface is clay to sandy clay. Weak platy structure erodes readily. Color varies greatly depending on parent materials.

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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 dominated by shrubs with 20 to 40% cover, and then by perennial grasses with 5 to 15% cover, with 5 to 10% cover in trees, and 0 to 1% cover in forbs. Both canopy and basal cover values of grasses and some shrubs decrease during prolonged drought.

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: Dominant: Warm season grasses (25-30%) > Cool season grasses (15-25%) = Large shrubs (15-25%)

    Sub-dominant: >Sub-dominant: Half shrubs (5-10%) = Trees (5-10%) > Perennial forbs (3-5%)

    Other: other: Succulents (1-3%) = Annual forbs & grasses (1-5%)

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** In a normal year up to 10 to 15% of grasses and shrubs die off. During and after drought years there can be from 10 to 30% die off of shrubs and grasses. Severe winter droughts affect shrubs, trees and cool season grasses the most. Severe summer droughts affect the warm season grasses the most.

14. **Average percent litter cover (%) and depth (in):** Within plant interspaces litter ranges from 10 to 20 % cover with no real depth, while under shrub and tree canopies it ranges from 50 to 100% cover with depths from 1/8 to ½ inch thick. Litter amounts increase during the first few years of drought, then decrease in later years.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 300-500 lbs/ac in dry years; 500-700 lbs/ac in normal years; 700-900 lbs/ac in wet 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:** Herbaceous species that can invade this site are Russian thistle and annual grasses, such as cheatgrass. Other species that have the potential to invade and increase with time are juniper, broom snakeweed, rabbitbrush, and Mormon tea. are on the site.

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