USDA Natural Resources
Conservation Service

Ecological site R041XA102AZ
Shallow Hills 16-20" 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:** North and South aspects: No rills.

   Note: When evaluating range health on this ecological site, aspect and slope affect expected reference conditions and should be factored into evaluation. Revision to original reference sheet incorporates reference conditions described from north- and south-facing aspects with 25% slope, 12 years post-burn (Ryan Fire).

2. **Presence of water flow patterns:**
   North aspect: very short (5ft), discontinuous, almost indistinguishable among high cobble/gravel/vegetation cover.
   South aspect: common (5-15% of area), short (<5ft) and discontinuous and rock/gravel armored.

3. **Number and height of erosional pedestals or terracettes:**
   North aspect: pedestals uncommon on perennial grasses; terracettes common, 2-3 ft. apart with 2-4" elevation difference.
   South aspect: pedestals uncommon on perennial grasses; terracettes common, 2-3 ft. apart with 2-4" elevation difference.

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

North aspect: 5-10% bare ground evenly distributed among gravel/rock cover; non-vegetated areas are scarce. After fire, 25-30% bare ground is observed.
South aspect: 10-15% bare ground evenly distributed among gravel/rock cover; After fire, 25-30% bare ground is observed.

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

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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):** North and South aspects: Fine litter moving less than 1 foot, coarse litter stays in place.

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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):** North and South aspects: No difference between canopy-protected and unprotected soil slake values. All values rated as 5s and 6s.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** North and South aspects: Soil surface horizon 0-3" depth, very gravelly sandy loam, granular structure. Dark colored, 7.5 YR 3/2 moist, 7.5YR 5/2 dry.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
North aspect: Perennial grasses are well-dispersed across site with basal cover 5-12%. Foliar cover is 35-40% perennial grasses and 5-10% Emory oak.
South aspect: Perennial mid-grasses dominant with an evenly dispersed short-grass community. Basal cover of perennial grasses is 4-10%. Foliar cover of perennial grasses is 30-45%.

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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):** North and South aspects: No compaction. Clayey (argillic) horizon at 3" depth may be mistaken for compaction.

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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:
North aspect: Warm season mid-grasses.
South aspect: Warm season mid-grasses > short-grasses

Sub-dominant:
North aspect: trees > low shrubs > perennial forbs
South aspect: low shrubs (mimosa spp) > perennial forbs

Other: succulents

Additional: Annual forbs and annual grasses fluctuate with precipitation and can flourish for a season post-burning

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** North and South aspects: Perennial grass decadence increases with time since last fire. 12 years post-burning, both aspects exhibit some perennial grasses decadence, little mortality seen.

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14. **Average percent litter cover (%) and depth (in):** North aspect, 45% litter cover; South aspect, 15% litter cover (at present)

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 524 lbs/ac. in a below average year; 1240 lbs/ac. in an average year; 1985 lbs/ac. in an above average year. North aspect annual production is slightly higher than south aspect, 1200 #/ac (north aspect) and 1000 #/ac (south aspect) observed in year with average rainfall.

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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:** Lehmann lovegrass, Boer lovegrass, yellow bluestem, mesquite, wait-a-bit mimosa

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17. **Perennial plant reproductive capability:** Not impaired. Warm season perennial grass seed production highly dependent upon the amount and timing of summer monsoons.
