

Ecological site R041XA104AZ Limy Slopes 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	Curtis Talbot
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None.

Note: When evaluating range health on this ecological site, aspect and slope affect expected reference conditions and should be factored into evaluation. Reference conditions described were north- and south-facing aspects with 40% slope. Fire disturbance history for the site was that the north slope was 11 growing seasons post-burn; the south slope was 4 growing seasons since last fire (it also burned 11 years prior to this reference observation).

2. **Presence of water flow patterns:**

North aspect: Short, discontinuous water flow patterns.

South aspect: Numerous, short (4-6 ft. in length), discontinuous.

3. **Number and height of erosional pedestals or terracettes:**

North aspect: 1" pedestals common on perennial grasses. Terracettes are common, 1-2 ft. apart, and well-vegetated.

South aspect: Pedestals uncommon. Terracettes common, 1-3 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: Bare ground observed at 30% following fire and decreases to 10%-20% within one year after burning.

Non-vegetated areas are scarce.

South aspect: Bare ground observed at 30% following fire and decreases to 10%-20% within one year after burning. Non-vegetated areas are very small (<1 ft diameter) and well-dispersed.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** North and South aspects: None

7. **Amount of litter movement (describe size and distance expected to travel):** North and South aspects: Fine litter generally moving along water flow patterns and accumulates on terracettes.

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: Slake test values of all samples collected under canopy of perennial grasses and shrubs rated as "6". Samples with no canopy protection ranged from "3" to "6" (40% of no canopy samples were "3"s).

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** North and South aspects: Soil surface horizon was a gravelly sandy clay loam, 0-5" depth, color 10YR 3/3 moist, weak subangular block structure immediately below a weak platy surface.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

North aspect: Perennial mid-grasses dominant with evenly dispersed succulents (desert spoon) and scattered oak trees. Basal cover of perennial grasses ranged 4-10%, well-dispersed; tree and succulent canopy cover is 5-10%. Perennial grass basal cover is generally lower during the first five years following fire. Well-dispersed perennial grasses slow rainfall run-off allowing infiltration. The slowing of run-off around perennial grass bases also causes sediment to accumulate on the upslope side of the plants, forming terracettes.

South aspects: Perennial suffrutescent grasses dominant with an evenly dispersed perennial grass community. Basal cover of perennial grasses ranged 4-10%, well-dispersed. Perennial grass basal cover is generally lower during the first five years following fire. Well-dispersed perennial grasses slow rainfall run-off allowing infiltration. The slowing of run-off around perennial grass bases also causes sediment to accumulate on the upslope side of the plants, forming terracettes.

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. Average depth of penetration from an ARS field penetrometer with a 2.2 kg. sliding hammer was 8.8 cm.

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: mid-grasses > succulents.

South aspect: suffrutescent grasses = perennial mid-grasses

Sub-dominant:

North aspect: trees > large shrubs.

South aspect: perennial short-grasses > subshrubs > perennial forbs

Other: perennial forbs present on north aspects and succulents present on south aspects

Additional: Annual forbs and annual grasses fluctuate with precipitation and can flourish post-burning.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** North and South aspects: Very little mortality or decadence during the first five years after burning. Expect increases in decadence with 10+ years after burning. Mortality from fire depends upon season and intensity of burn.
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14. **Average percent litter cover (%) and depth (in):** North and South aspects: 15-30% litter cover with fire dynamic from 10 years of monitoring data encompassing 2 burns. Litter cover on the low end of the range is expected immediately post-burn and increases with favorable weather and time.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 671 lbs/ac. in a below average year; 1290 lbs/ac. in an average year; 1685 lbs/ac. in an above average year.
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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, mesquite, wait-a-bit, yellow bluestem, white-thorn acacia
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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.
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