

## Ecological site R040XA111AZ Limy Upland 10"-13" 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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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

- Number and extent of rills:** Waterflow patterns will often generate weakly-defined rills due to low cover on the site. May be continuous from top to bottom of slope.
- Presence of water flow patterns:** Common and widespread, covering up to 35% of bare ground on the site. Gravel armoring helps protect site and limit evidence of waterflow patterns.
- Number and height of erosional pedestals or terracettes:** Pedestals will be common at the base of long-lived perennial grasses and shrubs. Exposed roots should be very rare, and the root-shoot interface should still be protected by the soil.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 30-40%. Will be lower on sites with high rock cover (needs to be verified). Most areas that have low rock cover on this site will have corresponding higher lichen cover.
- Number of gullies and erosion associated with gullies:** none
- Extent of wind scoured, blowouts and/or depositional areas:** none due to high gravel content

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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous and fine woody material may move 1 meter downslope in rills and waterflow patterns. Coarser woody material (>1 cm in diameter) should move little if at all, and only in concentrated waterflow patterns and rills.
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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):** Average 5-6 under shrub and grass canopies, and 4.5-5.5 in plant interspaces due to high microbial crust cover (including cyanobacteria) on these sandy loam - fine sandy loam surface textured soils with high carbonate content.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak, fine granular structure in interspaces and weak to moderate fine granular under perennial canopies. Very limited evidence of A horizon development except under perennial canopies.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Limited perennial grass basal cover and litter/soil accumulation under shrubs should increase flow path length and infiltration. Higher plant density and cover often associated with the rills, allowing greater retention of water than would otherwise occur on this site.
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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):** None. Will see approximately 1-2 cm. surface crusting in interspaces.
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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: Long-lived large shrubs (creosote, bursage) > [short-lived subshrubs < > succulents <> shrub-like perennial grasses with above-ground growing points (e.g. bush muhly and black grama) <> long-lived perennial bunchgrasses (e.g. *Aristida* sp.)] >> (annual and perennial forbs, short-lived perennial grasses (fluffgrass), annual grasses, trees, and tree-like shrubs.
- Sub-dominant:
- Other:
- Additional:
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Would normally expect to see some mortality in all functional groups in response to drought, especially short-lived perennial grasses and some of the bunchgrasses. Creosote and bursage will lose some branches during drought, and there may be limited die-back of subshrubs, however, there should not be widespread mortality, even during drought, on this drought-adapted site, except for short-lived perennial grasses (fluffgrass).
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14. **Average percent litter cover (%) and depth (in):** Near 0% in interspaces, and 10-90% under canopies, depending on

time since significant production on the site. This site is extremely dynamic due to high rates of removal in runoff, and high decomposition rates associated with favorable conditions and termite activity.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 73 lbs/ac unfavorable precipitation; 285 lbs/ac normal precipitation; 560 lbs/ac favorable precipitation.
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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:** None. May want to watch malta starthistle and bluffgrass, but unlikely to move onto this droughty site.
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17. **Perennial plant reproductive capability:** Will only see reproduction during favorable years. Significant reproduction will only occur for most perennial species during 10-15 of every 50 years.
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