

Ecological site R048AA247CO Deep Clay Loam Shale Highlands LRU

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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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Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** Slight. A few short rills slight on slopes less than 15%. Rills can be more defined on slopes greater than 15%. After intense storms, after wildfires, extended droughts or a combination of these disturbances rill will increase in number.
- Presence of water flow patterns:** Slight. Flow paths should be short and mostly disconnected with debris dams obvious. Flow patterns should only be present following an intense weather event. Flow length and numbers will
- Number and height of erosional pedestals or terracettes:** Some pedestals can be expected near or in flow paths from water. Wind cause pattern are rare and usually only on this site after wildfires, and/or extended drought. On steeper slopes, with the additional water from intense storms, slightly more pedestals would be expected.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect 10-20% bare ground. Extended drought can cause bare ground to increase.
- Number of gullies and erosion associated with gullies:** Rare and when drainages are present they are stabilized with native vegetation and should show no active signs of erosion. Some gullies may be present on steeper slopes where flows have concentrated from high intensity, low frequency rainfall events.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind erosion is minimal to non-existent. Significant wind erosion would only be present following wildfire, and/or extended drought. Wind scour, blowouts and/or depositional areas should be rare and only associated with disturbances (examples: bedding areas and small mammal burrows).
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7. **Amount of litter movement (describe size and distance expected to travel):** Litter should be evenly disturbed across the site with it being a little thicker under the shrub canopy. Litter movement consists primarily of redistribution of fine litter (herbaceous plant material) associated with flow paths. Movement is expected to be short and minimal. Litter movement will be greater after wildfires, extended drought and other disturbances. High intensity thunderstorms may increase the amount and size of materials moved.
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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):** Stability class ratings are expected to be 5-6 under the plant canopy and protected and 3-4 in the interspaces with no protection at soil surface.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Average SOM is 1-5%. Surface soils range from silty clay loam to clay loam. Soils are typically deep and well drained with a high water holding capacity. The A-horizon ranges from a 0-10 inch depth with a grayish brown color. The surface structure can be weak fine granular, weak medium granular, weak fine sub-angular blocky and weak medium sub-angular blocky structures.
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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. The heavy clay soils on this site are naturally subject to slow infiltration but the perennial vegetation provides adequate cover to intercept most rain drops and reduce raindrop splash erosion. Extended drought reduces perennial plant cover which in turn causes decreased infiltration and increased runoff following intense storms.
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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):** No compaction layer should be present. Naturally occurring soil horizons may be harder than the surface and should not be considered as compaction layers.
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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: Dominant Native Cool Season Rhizomatous >> Subdominant Perennial Native Forbs > Dominant Native Cool Season Bunchgrass>
- Sub-dominant: Occasional Native Cool Season Bunchgrasses = Dominant Native Non-Sprouting Shrub > Dominant Perennial Native Forbs = Subdominant Perennial Native Forbs>>
- Other: Occasional Native non-sprouting Shrubs > Occasional Sprouting Native Shrubs

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Typically minimal. Expect slight shrub and grass mortality/decadence during and following drought. Extended drought would tend to cause relatively high mortality in short lived species. Shrub mortality would be limited to severe droughts. Sagebrush species are most affected by lack of snow during the winter. The combination of wildfire and extended droughts would cause even more mortality for several years after the fire than either disturbance functioning by itself would cause.

14. **Average percent litter cover (%) and depth (in):** The reference community average 50-60% litter under the shrub canopy and 10 to 30% in the interspaces where no plant cover is litter cover declines during and following a drought. After wildfires, and/or extended droughts, litter cover and depth decreases to none immediately after the disturbance and dependent on climate and plant production increase to post-disturbance levels in 1 to 5 growing seasons.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1500 lbs. /ac. low precipitation years; 2000 lbs. /ac. average precipitation years; 2500 lbs./ac. above average precipitation years. After extended drought or the first growing season following wildfire, production may be significantly reduced by 500 – 600 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:** Kentucky bluegrass

17. **Perennial plant reproductive capability:** All plant species should be capable of reproduction depending on availability of water. All plants should be vigorous, and healthy. Plant should produce seed heads and, vegetative tillers, etc. The only limitations are weather-related, wildfire, natural disease, inter-species competition, wildlife, and insects that may temporarily reduce reproductive capability.
