USDA Natural Resources
Conservation Service

Ecological site R038XA109AZ
Loamy Upland 12-16 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	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Some rills may form due to loamy surface textures, slow permeability, and medium runoff, especially on steeper slopes.

2. **Presence of water flow patterns:** Water flow patterns may be common due to slow permeability and medium runoff, especially on steeper slopes.

3. **Number and height of erosional pedestals or terracettes:** Some pedestals and terracettes may occur, but they should be very short.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground should not exceed 25 percent. The Loamy Upland ecological site has an average available water capacity of 7 inches, so it has a moderate to high potential for the production of plant cover. Sites with a cover of rock fragments will have less bare ground. Drought may cause an increase in bare ground.

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

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

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous and fine woody litter will be transported in water flow pathways. Coarse woody litter will remain under shrub canopies.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Surface soil stability values average 5 both under plant canopies and in the interspaces. Surface textures are mostly sandy loam, loam, or sandy clay loam. Often the surface horizon is gravelly, but sometimes not. When well vegetated, these soils have a moderate to high resistance to both water and wind erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is either granular (weak to moderate, fine to medium) or platy (weak, medium to thick). Surface thickness is 2 to 3 inches. Color is variable depending upon parent material.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The Loamy Upland ecological site is characterized by a relatively even distribution of mostly grasses with a few shrubs and forbs. One area had 30 percent canopy cover with overlapping layers of plants (15 percent grass, 5 percent forbs,15 percent shrubs). Basal cover was 1 percent (grass only). Both canopy and basal cover values decrease during prolonged droughts. This type of plant community is highly effective at capturing and storing precipitation.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Due to loam and clay loam textures, these soils may be easily compacted when there are no rock fragments in the surface horizons. Some surface horizons are naturally platy.

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: none

    Sub-dominant: warm-season bunchgrasses = warm-season colonizing grasses shrubs cool season bunchgrasses

    Other: Minor: forbs
    Trace: cacti Agave family = annual grasses

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All plant functional groups are adapted to survival in all years except during the most severe droughts. Severe winter droughts affect shrubs and trees the most. Severe summer droughts affect grasses the most.

14. **Average percent litter cover (%) and depth (in):** Mostly herbaceous litter with some woody litter. 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):** 500 to 575 pounds per acre (dry weight) in drought years, 575 to 750 pounds per acre in median years, 750 to 850 pounds per acre 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:** Broom snakeweed, prickly pear cactus (Opuntia), cholla cactus (Cylindropuntia), turbinella oak, desert ceanothus, wait-a-bit, catclaw acacia, and shrubby buckwheat are all native to the Loamy Upland ecological site, but have the potential to increase and dominate the area after heavy grazing and/or fire exclusion. Juniper (Juniperus) and pinyon pine (Pinus) species are native to neighboring sites and can invade the site after heavy grazing and/or fire exclusion. Redstem filaree, purslane (Portulaca), and spurge (Euphorbia) are exotic forbs (some species of Portulaca and Euphorbia are native) that may invade the site after heavy grazing, soil disturbance, or fire. Red brome is an exotic annual grass that may invade the site after heavy grazing, soil disturbance, or fire.

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