Ecological site R038XC317AZ
Volcanic Hills 20-24"

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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	Scott Woodall
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** The reference site is not conducive to rill formation. There is high cover of grass, trees, and shrubs with woody species being scattered and herbaceous species abundant to the perimeter of woody species. Grass plants are less than 1 foot apart in the interspaces of woody species and in addition to high gravel and rock cover provide a highly sinuous flow path for overland flow.

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2. **Presence of water flow patterns:** Water flow paths are very hard to observe on the site due to high herbaceous litter, high density of herbaceous plants, and high gravel and rock cover. Perennial grass plants are less than 1 foot apart in the interspaces of woody species and in addition to high gravel and rock cover provide a highly sinuous flow path for overland flow.

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3. **Number and height of erosional pedestals or terracettes:** None present on the site. Herbaceous production is dominated by very dense bunchgrasses that are not conducive to pedestalling or terracette formation. There are approximately 10-15 perennial bunch grass plants per square yard in the interspaces between woody species.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0-1%.

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5. **Number of gullies and erosion associated with gullies:** None present on the site.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None present on the site. Plant community is shrub and tree dotted savanna with very dense perennial bunch grass plants and 35-45% gravel and rock cover in the interspaces that is not conducive to wind erosion.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter is transported less than 2 feet before being intercepted by high density perennial bunch grass plants. Woody litter stays in place near parent plants.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Stability values range from 5-6 across most of the site.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak to moderate fine to medium granular structure 1-2 inches thick. Color is 5YR 4/2 to 7.5YR 3/2 dry and 5YR 2.5/2 to 7.5YR 23/2 moist. Organic matter is 1-3%.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial bunch grass plants are the most extensive in terms of canopy cover on the site and at 10-15 plants per square yard in interspaces of trees are highly effective at promoting infiltration and reducing the energy of water that leaves the site.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None present on the site. Argillic horizon at 1-2 inches deep may be mistaken for a compaction layer. High gravel and cobble in subsurface are usually easily detected.

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: perennial bunch grass > trees > cool season grass > evergreen shrubs > perennial forbs = short grasses

    Sub-dominant: succulents = miscellaneous grass = annual grass = annual forbs

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 5-10% canopy mortality of trees and shrubs.

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1685 lbs/ac in below average year, 2360 lbs/ac in average year, 2910 lbs/ac in above average year.

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:** Alligator juniper is the most common species on cooler aspects, one seed or redberry juniper on warmer aspects. Oaks are second most common species. Annual goldeneye can become problematic where trees and shrubs have not increased and continuous herbivory from livestock or wildlife have reduced vigor of short grasses.

17. **Perennial plant reproductive capability:** Not affected despite several years of prolonged drought in region.