USDA Natural Resources
Conservation Service

Ecological site R036XY289CO
Clayey Foothills

Accessed: 04/19/2024

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.

Author(s)/participant(s)	Original worksheet by Steve Myers and Scott Woodall dated 12-15-2004 Updated by J. Murray, C. Holcomb, L. Santana, F. Cummings, and S. Jaouen dated 1-19-2005. Updated 3-8-2017 by Suzanne Mayne-Kinney.
Contact for lead author	
Date	03/08/2017
Approved by	Rachel Murph, State Rangeland Management Spec., USDA NRCS Colorado
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None to slight, if present - short and shallow.

2. **Presence of water flow patterns:** Flow paths are expected but they are short and disconnected with numerous debris dams, Debris dams will be obvious after rainfall events.

3. **Number and height of erosional pedestals or terracettes:** Pedestals minor and become more prevalent on steeper slopes, occur in or near flow paths.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect 30-40% bare ground. Extended drought can cause bare ground to increase.

5. **Number of gullies and erosion associated with gullies:** Gullies are inherent to the site, widely spaced with sharp edges, typically caused by concentrated flows. Depth is limited by bedrock.

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement associated with flow paths. Movement is typically short (<1 foot). Movement can be extensive with concentrated flow.

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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 rating anticipated to be 2-3 in the interspaces at soil surface.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface texture ranges are usually loam, clay loam, or silty clay loam. Soils are moderately deep to deep and rock free. Depth of the A horizon is typically 0-12 inches deep with a grayish brown colors. Structure is weak fine granular, very friable, and plastic.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Grasses and shrub canopy, basal cover, and inherent interspaces between plants allow for overland flow, providing a lost opportunity for infiltration to occur. The composition of the plant community has less effect on infiltration and runoff than does slope and texture.

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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

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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: cool season rhizomatous grasses (Western Wheatgrass) >

    Sub-dominant: shrubs (Wyoming big sagebrush, yellow rabbitbrush, winterfat, > cool season bunchgrass (Indian Ricegrass, Salina wildrye, prairie Junegrass, bottlebrush squirreltail) >

    Other: forbs (Penstemons, stemless goldenweed, cryptantha, buckwheat, milkvetches, scarlet globemallow, scarlet gilia, asters, phlox > trees (Pinyon, Utah Juniper)

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Slight

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14. **Average percent litter cover (%) and depth (in):** 10-20% litter cover at < 0.25 inch depth. Litter cover declines during and following extended drought.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-**

production): 600 lbs./ac. low precip years; 900 lbs./ac. average precip years; 1200 lbs./ac. above average precip years. After extended drought or the first growing season following wildfire, production may be significantly reduced by 300 – 500 lbs./ac. or more.

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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:** Cheatgrass, rabbitbrush, pinyon/juniper and noxious weeds.

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17. **Perennial plant reproductive capability:** The major limitation are weather related (i.e. drought), wildlife, natural diseases, inter-species competition for moisture, wildlife and insects that may temporarily reduce reproductive capabilities.
