USDA Natural Resources
Conservation Service

Ecological site R046XH122WY
Loamy Wyoming Front

Last updated: 9/05/2018
Accessed: 05/09/2024

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)	K Clause, B Christensen
Contact for lead author	Karen Clause
Date	09/05/2018
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills not expected

2. **Presence of water flow patterns:** Not expected on this site. Some minor evidence of water movement may be found around perennial plant bases at upper end of the slope range (>10%), but they will be short (<3 ft), not common, and there will be no evidence of active erosion.

3. **Number and height of erosional pedestals or terracettes:** Pedestals and terracettes not expected

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground <5% expected. Canopy gaps comprise up to <5% of the ground surface, and are primarily in the 1-2 ft category with 1% in the 2-3 foot. Canopy gaps >3 ft are not expected. Basal gaps up to 15% are expected (10% in 1-2 ft, 5% in 2-3 ft and 3-6 ft categories). Basal gaps >6 ft are not expected.

5. **Number of gullies and erosion associated with gullies:** Gullies not expected.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind scour, blowouts and/or depositional areas are not expected for this site.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter not expected to move due to wind, but may occasionally be found in small concentrations in water flow patterns on slopes >10%. Large woody debris from sagebrush will show no movement.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil Stability Index ratings are expected to be variable for plant canopy and interspaces. Values of >4 are expected under plant canopy, and values >3 are expected in the interspaces. Average values >4 are expected.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil organic matter (SOM) 2-4% is common in surface layer. Typically soil surface consists of an A-horizon of 4-8 inches (10-20 cm) thick with weak to strong fine and medium granular structure that is dark grayish brown (10YR 4/2), dark gray (10YR 4/1), or dark brown (10YR 3/3) in color (dry). Field indicators of departure from the reference condition include exposure of subsoil with moderate medium sub-angular blocky structure, and further supported by excessive pedestalling, terracettes, and/or surface disturbance.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 35-60% grasses, 15% forbs, and 25-50% shrubs (predominantly non-sprouting) composition by dry weight. Foliar cover (plant canopy) >80% and basal plant cover 5-10% is expected for this site.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None expected for this site

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:

    Sub-dominant:

    Other:

    Additional: 1.1 non-sprouting shrubsmid-size, cool season bunchgrassessprouting shrubs=perennial forbscool season rhizomatous grasses=short cool season bunchgrassesannual forbs
    1.2 mid-size, cool season bunchgrassessprouting shrubsperennial forbscool season rhizomatous grasses=short cool season bunchgrasses=non-sprouting shrubsannual forbs

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal decadence, typically associated with shrub component.

14. **Average percent litter cover (%) and depth (in):** Litter ranges from 5-15% of total canopy measurement with total

litter (including beneath the plant canopy) from 60-90% expected. Herbaceous litter depth typically ranges from 3-10mm. Woody litter can be up to a couple inches (4-6 cm).

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 1400-2200 lb/ac (1800 lb/ac average); Metric 1570-2465 kg/ha (2020 kg/ha average).

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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:** Encroachment by native conifers can occur when the disturbance regime is altered to exclude fire. Weeds that can invade and become dominant include: Canada thistle, musk thistle, houndstongue, black henbane, leafy spurge, Russian and spotted knapweed, yellow and Dalmation toadflax, Dyer's woad, and hoary cress (whitetop). Annual weeds such as mustards are common in disturbed sites.
    Cheatgrass, an invasive annual grass, is not expected in undisturbed rangelands, but has been found in disturbed areas and on nearby sites on southerly aspects. Field brome and bulbous bluegrass are invasive grasses of concern that have been documented, but are not expected for the site. The ecological dynamics of this site are in imminent danger of being forever altered with the presence of these invasive grasses.

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17. **Perennial plant reproductive capability:** All species are capable of reproducing, with rhizomatous wheatgrass reproducing from tillers as well as seed, except in drought years.
