USDA Natural Resources
Conservation Service

Ecological site R067BY010CO
Closed Depression

Last updated: 9/08/2023
Accessed: 04/23/2024

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)	Harvey Sprock, Daniel Nosal
Contact for lead author	Harvey Sprock, Area Rangeland Management Specialist, Greeley, CO
Date	01/12/2005
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

2. **Presence of water flow patterns:** None

3. **Number and height of erosional pedestals or terracettes:** None

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 3 perent or less bare ground, with bare patches generally less than 2-3 inches in diameter. Extended drought or long-term ponding can cause bare ground to increase to 10-20 percent or more with bare patches reaching to 6-12 inches in diameter or more.

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):** Litter should be uniformly distributed with little movement.

---

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Stability class rating is anticipated to be 5-6 in interspace at soil surface.

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Average SOM is 2-5 percent. A-horizon ranges from 0-5 inches. Surface texture is loam to clay loam. Soils are typically deep to very deep, grayish to very dark brown, strong very fine granular to medium sub-angular blocky structure.

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Raindrop impact is reduced by the diverse grass, forb, shrub functional/structural groups and root structure. This slows overland flow and provides increased time for infiltration to occur. Extended drought, wildfire or both may reduce basal density, canopy cover, and litter amounts (primarily from tall, warm-season bunch and rhizomatous grasses), resulting in decreased infiltration and increased runoff on steep slopes following intense rainfall events.

---

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Typically none. Physical impact during wet or ponded periods may cause some compaction.

---

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 mid rhizomatous > >

    Sub-dominant: Warm-season short bunchgrass > cool-season mid bunchgrasses/grasslikes > shrubs >

    Other: leguminous forbs > warm-season short stoloniferous > warm-season forbs > warm-season mid bunchgrass > cool-season forbs

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Typically minimal. Expect some mortality during and following extended drought or extended inundation.

---

14. **Average percent litter cover (%) and depth (in):** Litter cover during and following extended drought or inundation ranges from 15-35 percent.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 800 lbs./ac. low precip years; 1300 lbs./ac. average precip years; 1900 lbs./ac. above average precip years. After extended drought or the first growing season following wildfire, production may be significantly reduced by

350 – 650 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:** Invasive plants should not occur in reference plant community. Cheatgrass, Russian thistle, burningbush, and other non-native annuals may invade following extended drought or fire assuming a seed source is available.

---

17. **Perennial plant reproductive capability:** The only limitations are weather-related, wildfire, natural disease, and insects that may temporarily reduce reproductive capability.
