

Ecological site R069XY048CO Shale Breaks

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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	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None on flatter slopes. Short, widely spaced rills will be present on steep slopes with shale outcrop.

2. **Presence of water flow patterns:** On slopes of 15 percent or less patterns will be broken and irregular in appearance. Flow patterns will be evident as slope and shale outcrops increase (especially following intense storms). They will be short and connected with occasional debris dams or vegetative barriers.

3. **Number and height of erosional pedestals or terracettes:** Small pedestals and terracettes will exist, ranging in height from 0.25 – 0.5 inches. They will be few in number and confined to the steeper slopes (>15 percent) and shale outcrop.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** The site has 7-12 percent or less bare ground, with bare patches generally less than 3-5 inches in diameter. Extended drought causes bare ground to increase upwards to 15-20 percent with bare patches reaching upwards to 12-18 inches in diameter.

5. **Number of gullies and erosion associated with gullies:** Typically none. However, on steep slopes, gullies may be up to 5 feet in length and wide-spread, not exceeding 8 inches deep.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** There is none to slight wind scour on exposed areas. Small depositional areas will occur as slope decreases.
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7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement is minimal and short on flatter slopes. Small herbaceous litter movement is associated with water flow patterns and may move as much as 1-3 feet down slope during severe precipitation events, especially on steeper slopes.
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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 4-5 in interspaces at soil surface. These values need verification at reference site.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Average SOM is 1-2 percent. The soils are shallow. The A horizon is grayish-brown, very fine granular structure, and approximately 0-2 inches in depth.
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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.
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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: Warm-season mid bunchgrass >
- Sub-dominant: Cool-season mid rhizomatous grass > shrubs > warm-season short bunchgrass > warm-season mid rhizomatous grass = cool-season mid bunchgrass >
- Other: warm-season forbs > leguminous forbs > cool-season forbs = sedges > warm-season short stoloniferous
- Additional:
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Typically minimal. Expect short and mid bunchgrass mortality and decadence during and following drought.
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14. **Average percent litter cover (%) and depth (in):** Litter cover during and following extended drought ranges from 5-15 percent.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 150 lbs. /ac. low precipitation years; 300 lbs. /ac. average precipitation years; 700 lbs. /ac. above average precipitation years. After extended drought or the first growing season following wildfire, production will be significantly reduced.

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, other non-native annuals may invade following extended drought or fire if a seed source is available.

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