

Ecological site EX043B23B168 Steep Loamy (SLy) Absaroka Upper Foothills

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

Indicators

- Number and extent of rills:** Rills on steeper slopes are common. Rill occurrence may increase slightly on areas located below exposed bedrock or other water shedding areas where increased runoff may occur. Rills should be <2 inches deep, short to moderate in length (4 to 10 feet) and somewhat widely spaced (4-8 feet). An increase in rill development may be observed immediately following major thunderstorm or spring runoff events.
- Presence of water flow patterns:** Sinuous flow patterns are common and wind around perennial plants and any surface rock. Evidence of flow patterns is expected to increase somewhat as slopes approach 80%. Water flow patterns can be long (10 to 20 feet), somewhat narrow (1 to 2 feet wide), and spaced widely (5 to 10 yards) and more closely spaced (3 to 6 yards) on slopes nearing 70 to 80%.
- Number and height of erosional pedestals or terracettes:** Small pedestals will form at the base of plants that occur on the edge of water flow patterns, 2 to 4% of plants show minor exposed roots. Terracettes are fairly common, forming behind debris dams of small to medium sized litter (up to 2 inches in diameter) in water flow patterns. These debris dams may accumulate smaller litter (leaves, grass and forb stems) and sediment.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20–30%. (Soil surface is typically covered by 0-15% surface fragments). Most bare ground is associated with water flow patterns, rills, and gullies. Bare ground spaces not associated with flow patterns should not be greater than 1 to 2 feet in diameter.

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5. **Number of gullies and erosion associated with gullies:** A few gullies may occur. Any gullies present may extend down the length of the site until they reach a stream or other area where water and sediment is diverted or accumulates. Gullies show slightly more indication of erosion as slopes approach 75%, or where the site occurs adjacent to watershed areas with concentrated flow patterns.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Rare to nonexistent.
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7. **Amount of litter movement (describe size and distance expected to travel):** Because of the sites very steep slopes, some litter redistribution downslope caused by water movement is normal. Some litter removal may occur in flow channels with deposition occurring within 3 to 5 feet at points of obstruction. The majority of litter still accumulates at the base of plants. Some grass leaves, stems and small woody twigs may accumulate in soil depressions adjacent to plants. Large woody debris will show only slight movement down slope. A slight increase in litter movement is expected following runoff resulting from heavy spring runoff or thunderstorms.
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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):** Soil Stability Index ratings range from 3 (interspaces) to 6 (under plant canopy), but average values should be 4.0 or greater. Vegetation cover, litter, biological soil crusts and any surface rock present reduce erosion.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil data is limited for this site. Described A-horizons vary from 6-23 inches (15-58 cm) with OM of 2 to 5%.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 75-80% grasses, 15% forbs, and 5-10% shrubs. Evenly distributed plant canopy (60-95%) and litter plus moderate infiltration rates result in minimal runoff. Basal cover is typically greater than 10% for this site and does affect runoff on this site.
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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):** No compaction layer or soil surface crusting should be present
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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: Mid-stature, cool season bunchgrasses (3 species)
- Sub-dominant: Short-stature. cool season bunchgrasses (1 Species)>perennial shrubs (1 Species) = perennial forbs
- Other: Community 1.1 = Perennial Mid-Stature bunchgrasses > Perennial Short-stature bunchgrasses > Perennial Forbs = Shrubs
- 12b. F/S Groups not expected for the site: Annual Grass
- 12c. Number of F/S Groups: 5 groups
- 12d. Species number in Dominate and Sub-dominate F/S Groups: 5 species

Additional: Following a recent disturbance such as fire, drought or insects that may remove the woody vegetation, forbs and perennial grasses (herbaceous species) may become more dominate in the community. These conditions may reflect a different functional community phase within the reference state.

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. During years with average to above-average precipitation, there should be very little recent mortality or decadence apparent in shrubs or grasses. During severe (multi-year) drought up to 20% of the shrubs may die, either from drought, insect damage or pathogens.
 14. **Average percent litter cover (%) and depth (in):** Litter ranges from 5-40% of total canopy measurement with total litter (including beneath the plant canopy) from 50-90% expected. Herbaceous litter depth typically ranges from 5-15mm. Woody litter can be up to a couple inches (4-6 cm).
 15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 800-1300 lb/ac (1050 lb/ac average); Metric 896-1457 kg/ha (1176 kg/ha average).
 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:** Bare ground greater than 30% is the most common indicator of a threshold being crossed. Big sagebrush, rubber rabbitbrush, and bluegrasses are common increasers. Kentucky bluegrass, common dandelion, thistles, and annual weeds such as kochia and mustards are common invasive species in disturbed sites.
 17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in extreme drought years.
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