

Ecological site EX043B23B170 Steep Stony Upland (SStU) 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

- 1. Number and extent of rills:** Rare. Increase in rill development occurs on slopes located below exposed bedrock or other water shedding areas where increased runoff may occur. When present, rills should be short (2-5 feet), and less than one inch deep and somewhat widely spaced (4-8 feet). Rills may increase in length (3-6 feet) and decrease in spacing (3-6 feet) on slopes greater than 60 percent. A minor increase in rill development may be observed on all slopes following major thunderstorm or spring runoff events but should heal during the next growing season.
 - 2. Presence of water flow patterns:** Barely observable. Minor evidence of water flow patterns will be found around perennial plant bases. Occurrences show little evidence of current erosion, and are expected to be short (3-6 feet), stable, sinuous, and not connected. There may be very minor evidence of deposition.
 - 3. Number and height of erosional pedestals or terracettes:** Perennial vegetation shows little evidence of erosional pedestalling (1 to 2% of individual plants). Plant roots are covered and litter remains in place around plant crowns. Terracettes are minor and are stable.
 - 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground can range from 5-20%. Bare ground patches should not be greater than 18 inches in diameter.
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5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Rare to nonexistent. No evidence of wind generated soil movement is present. Wind caused blowouts and deposition are not present.
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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous and large woody litter not expected to move. Most litter resides in place with some redistribution down slope caused by water movement. The majority of litter accumulates at the base of plants. Some grass leaves and stems may accumulate in soil depressions adjacent to plants. Woody stems are not likely to move. However, some litter movement is expected (up to 6 feet) with increases in slopes >25% and/or increased runoff resulting from heavy 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.
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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. Soil organic matter of 2 to 5% is expected.
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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 70-80% grasses, 15% forbs, and 5-15% shrubs. Evenly distributed plant canopy (60-95%) and litter plus moderate infiltration rates result in minimal runoff. Basal cover is typically 5-15% for this site and does affect runoff on this site. Surface rock fragments of 15-50% provide stability to the site, but reduce infiltration.
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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: Mid-stature, cool season bunchgrasses >>
- Sub-dominant: perennial shrubs >> perennial forbs >>
- Other: tall-stature, cool-season bunchgrasses = cool-season rhizomatous grasses = short-stature, cool-season bunchgrasses
- Additional: Following a disturbance such as fire, drought, rodents or insects that remove woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community for a period of time. These conditions would reflect a functional community phase within the reference state.
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or**

decadence): All age classes of perennial grasses should be present under average to above average growing conditions. There may be partial mortality on individual bunchgrasses and shrubs during drought periods, and complete mortality of individual plants during severe drought periods. Slight decadence in the principle shrubs could occur near the end of the fire cycle or during periods of extended drought, or insect infestations. In general, a mix of age classes should be expected with some dead and decadent plants present.

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 5-15 mm. 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):** Total annual production ranges from 500-900 lb/ac (560-1,009 kg/ha); with an average production of 750 lb/ac (841 kg/ha).
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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:** Bare ground greater than 30% is the most common indicator of a threshold being crossed. Rhizomatous wheatgrasses, Idaho fescue, Sandberg bluegrass, spike trisetum, rocky mountain juniper, and fringed sagewort are common increasers. Kentucky bluegrass, common dandelion, thistles, and annual weeds such as cheatgrass and mustards are common invasive species in disturbed sites.
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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in extreme drought years.
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