USDA Natural Resources
Conservation Service

Ecological site EX043B05C113
Granitic Loamy Bighorn Mountains Sub-alpine Zone

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

Indicators

1. **Number and extent of rills:** Rare to nonexistent. Where present, short and widely spaced.

2. **Presence of water flow patterns:** Barely observable. Lack of sagebrush or other woody vegetation allow for water flow patterns to be slightly more visible if present, but they should not be present in any significance.

3. **Number and height of erosional pedestals or terracettes:** Rare to nonexistent.

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 0-10%.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Rare to nonexistent.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous and woody debris should

show no expected movement.

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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. Described A-horizons vary from 3 -12 inches (7-30 cm) with OM of 6 to 16%.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The plant community consists of 65-75% grasses, 20% forbs and 0-5% shrubs. Evenly distributed plant canopy (70-95%) and litter plus moderate to moderately rapid infiltration rates result in minimal runoff. Basal cover is typically greater than 15% for this site and does effect 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):** 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: Cool-season Tall-stature Bunchgrasses Cool-season Mid-stature Grasses

    Sub-dominant: Perennial Forbs Cool-season Rhizomatous Grasses

    Other: Dwarf Shrubs

    Additional: Dominance of Mid-stature grasses varies with the extent of use and depth to gravels/grus. Generally, they are thought to be dominant but could fall as sub-dominant.

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

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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 15-30% expected. Herbaceous litter depth typically ranges from 5-15 mm. Woody litter would be considered incidental with minimal accumulation (< 1 in or 25 mm).

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 1500 - 2600 lbs/ac (2200 lbs/ac average); Metric: 1680 - 2915 kg/ha (2465 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: The increase of bare ground above 30% is an indicator that a threshold is being crossed. Corresponding increase will be noted in one or more of the following species is common: Sandberg bluegrass, buckwheat, phlox, and yarrow are common increasers. Non-native species such as common dandelion, smooth brome, Kentucky bluegrass, and timothy will also increase. Annual weeds and thistles are common on disturbed sites. Common noxious weeds that invade are: houndstongue, yellow toadflax, dalmation toadflax, common burdock, mullein, leafy spurge, and oxeye daisy. Cheatgrass and ventanata grass may be a concern in some areas.

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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
