

## Ecological site R035XC319AZ Limestone/Sandstone Upland 10-14" p.z.

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

### Indicators

- Number and extent of rills:** Some minor (short and narrow) rill formation is possible on steeper slopes due to loamy textures, moderate permeability, shallow depth, and rapid runoff. Rill formation will be reduced if the soil has a lot of rock fragment armor and/or a large amount of rock fragments in the profile.
- Presence of water flow patterns:** Water flow patterns may be occasional to common due to moderate permeability, shallow depth, and rapid runoff. These patterns are generally short and stable. There will be more water flow patterns in steeper areas and in areas with more rock outcrop and/or very shallow (<10") soils.
- Number and height of erosional pedestals or terracettes:** Some pedestals and terracettes may form, but they should be very short.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground generally ranges from 30-50%. Areas with greater cover of rock fragments and/or rock outcrop have less bare ground. This site usually has less than 1.5 inches of available water capacity, so the potential for production of plant cover is very low. Drought may cause an increase in bare ground.
- Number of gullies and erosion associated with gullies:** none

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6. **Extent of wind scoured, blowouts and/or depositional areas:** none
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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous and fine woody litter will be transported in water flow pathways. Coarse woody litter will remain under shrub and tree canopies. Litter movement may be greater in areas with very shallow soils and lots of rock outcrop.
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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 surface textures range from loamy very fine sand to sandy clay loam, but are mostly loam. Most surface horizons contain a significant amount of rock fragments (mostly gravels). Most soils also have at least 20% cover of rock fragments (mostly gravels). Cryptogams may cover up to 3% of the soil surface. When well vegetated or covered with rock armor, the soils have a high resistance to both water and wind erosion.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is mostly granular (weak to moderate, very fine to fine) or platy (weak to strong, thin to thick), while a few areas have surfaces that are subangular blocky (weak to moderate, fine to medium). Surface thickness ranges from 1-8 inches, but is usually 1-3 inches. Color varies depending upon parent material.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This site is characterized by a relatively uniform distribution of mostly shrubs and grasses with a few forbs. Canopy cover ranges from 15-40%, with the majority split between shrubs and grasses. Basal plant cover ranges from 10-20% (mostly grasses). The cover (especially basal cover) is reduced by the amount of rock fragment and/or bedrock ground cover. Both cover values decrease during a prolonged drought.
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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. Due to loamy surface textures, this soil may be easily compacted, but it is generally protected by a significant amount of rock fragment armor on the surface and within the surface horizons. Some of the soils have a naturally platy surface structure.
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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: none
- Sub-dominant: shrubs > warm season colonizing grasses > cool season bunchgrasses >
- Other: Minor: trees > perennial forbs > warm season bunchgrasses > half shrubs >
- Trace: annual forbs = annual grasses = Agave family = cacti
- Additional:
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All plant functional groups are adapted to survival except during the most severe droughts. Severe winter

droughts affect shrubs and trees the most. Severe summer droughts affect grasses most. Very shallow (<10") soils will show the most mortality in all functional groups.

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14. **Average percent litter cover (%) and depth ( in):** Litter consists of a combination of woody and herbaceous. Litter amounts increase during the first few years of drought, then decrease in later years.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 400-475 pounds per acre (dry weight) in drought years, 475-625 pounds per acre in median years, 625-700 pounds per acre in wet years.
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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:** Wyoming big sagebrush is native to the site, but has the potential to increase and dominate after heavy grazing. Broom snakeweed, Douglas rabbitbrush, pricklypear cactus, and cholla cactus are natives that have the potential to increase and dominate the site after a sagebrush fire and/or heavy grazing. Cheatgrass, red brome and redstem filaree are exotic annuals that are becoming endemic to the site regardless of management or fire frequency. They may become dominant plants on the site after a sagebrush fire, even with conservative or no grazing.
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17. **Perennial plant reproductive capability:** All plants native to the site are adapted to the climate and are capable of producing seeds, stolons, and rhizomes except during the most severe droughts.
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