

## Ecological site R035XE510AZ Sandstone Upland 6-10" 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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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

- 1. Number and extent of rills:** Minor rill formation may occur, mostly on steeper slopes without rock fragment armor, due to sandy loam textures, moderate permeability, very shallow depth, and high amount of rock outcrop directing runoff onto the soils.  

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- 2. Presence of water flow patterns:** Water flow patterns may be common due to moderate permeability, very shallow depth, and rapid runoff of the soils. There will be more water flow patterns in the steeper areas adjacent to rock outcrop.  

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- 3. Number and height of erosional pedestals or terracettes:** Some pedestals and terracettes may form, but they should be very short.  

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- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground will be reduced by the amount of surface rock fragments and rock outcrop found on the site. This site has less than one inch of available water capacity, so the potential for production of plant cover is very low. Drought may cause an increase in bare ground.  

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- 5. Number of gullies and erosion associated with gullies:** none.  

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6. **Extent of wind scoured, blowouts and/or depositional areas:** There may be occasional areas with sandier surfaces that have small blowouts and minor depositional areas around rock outcrop and plant bases.
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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 and by wind. Coarse woody litter will remain under shrub and tree canopies. Litter movement may be greatest in areas that are adjacent to 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 are usually fine sandy loam or sandy loam. Most surface horizons have a significant amount of gravel. Many areas have a large amount of rock fragments covering the soil surface. When well vegetated or covered with rock fragment armor, these soils have a high resistance to water erosion and a moderate resistance to 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 may be platy (moderate, thick), granular (moderate, fine), or subangular blocky (weak, fine). Surface thickness is 1-2 inches. Color is variable 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 patchy distribution of mostly shrubs with a lot of grasses and a few forbs. The patches of plants are found where there are soil deposits or standstone bedrock cracks that will secure roots and hold moisture. Canopy cover averages 21% (10% shrubs, 10% grasses, 1% forbs). Basal cover averages 2% (1% shrubs, 1% grasses). The cover is reduced by the amount of rock outcrop cover. Both plant 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. Some of the soils could be easily compacted, but they are generally protected by rock fragments in the profile. Some 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: shrubs >>
- Sub-dominant: cool season bunchgrasses > warm season colonizing grasses >
- Other: Minor: warm season bunchgrasses > forbs > Agave family = cacti >
- Trace: trees = annual grasses
- 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 the most.

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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):** 250-300 pounds per acre (dry weight) in dry years, 300-400 pounds per acre in median years, 400-500 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:** Broom snakeweed and threadleaf snakeweed are native to the site but have the capacity to increase with overgrazing. Red brome and cheatgrass are exotic annual grasses that have invaded many areas. These grasses can increase greatly during wet winters and springs.

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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 in most years except for the most severe droughts.

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