

Ecological site R039XA106AZ Stony Upland 17-22" 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	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Soil surfaces and plant communities on this site are variable. Rill formation is not likely on any of the soils when the site is well vegetated or covered with rock fragment armor. Soils with silt loam or loam surfaces have the potential to develop rills in the steeper areas, but these soils will generally support more forest cover. The tree cover is usually high enough to develop an O horizon or litter layer that protects the soil from raindrop impact, overland flow, and erosion. Soils with clay loam or silty clay loam surfaces have slow permeability, medium runoff, and may be susceptible to rill formation on steeper slopes. These soils generally support a rangeland plant community with less cover of trees. All soils have a significant amount of cobbles and stones on the surface or in the surface horizons that protects it from rill formation.
 - 2. Presence of water flow patterns:** Water flow patterns are not common in the areas with a high surface cover of litter and/or rock fragments. They may be common in steeper rangeland areas without tree cover due to slow permeability, medium runoff, and lack of tree litter cover.
 - 3. Number and height of erosional pedestals or terracettes:** Pedestals and terracettes are not common in the areas with tree litter. They may occur in areas without tree litter, but they will be very short.
 - 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** This site has an average available water capacity of 5 inches, so it has a moderate potential for the production of plant cover. 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:** 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 in areas without tree needle litter. Coarse woody litter will remain under shrub and tree canopies. There will not be much litter movement in areas with a high cover of tree needle litter.
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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 silt loam and loam to clay loam and silty clay loam. Most soils have a significant cover of cobbles and stones. All soils have a significant amount of cobbles or stones in the surface horizons. Many soils are protected by a layer of tree needle litter. The soils have high shrink/swell properties, especially in the subsurface, but there are usually no surface cracks. This physical property could lead to low aggregate stability. When well vegetated or covered with a significant amount of rock fragments or tree needle litter, these soils have a moderate to high resistance to water erosion and a high 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):** The mineral soil is generally 3 inches thick. Often there is a 2-inch thick O horizon or tree needle litter layer above the mineral soil. Color is variable depending on 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 even distribution of mostly grasses with some shrubs and forbs. There is usually a light canopy of trees, but there may be a thick canopy in areas where soil surface texture changes to clay loam. Both plant cover values (canopy and basal) decrease during 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):** These soils generally are not susceptible to compaction due to the high cover of rock fragment armor and the high volume of rock fragments in the profile. In the absence of rock fragments, the soils would be susceptible to compaction due to the loamy surface textures. Most 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: warm season bunchgrasses >>
- Sub-dominant: Cool season bunchgrasses >>
- Other: Minor: forbs > trees >
- Trace: shrubs > sedges
- 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 in all years 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):** Mostly herbaceous litter with some woody litter. 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):** 900-975 pounds per acre (dry weight) in dry years, 975-1125 pounds per acre in median years, 1125 to 1200 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:** Pingue rubberweed, rubber rabbitbrush, alligator juniper, and ponderosa pine are native to the site, but they have the capacity to increase and dominate after heavy grazing and/or fire exclusion.
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17. **Perennial plant reproductive capability:** All plants native to this site are adapted to the climate and are capable of producing seeds, stolons, and rhizomes in most years except during the most severe droughts.
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