USDA Natural Resources
Conservation Service

Ecological site R038XB204AZ
Granitic Hills 16-20" 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	Byron Lambeth
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Uncommon on most of this site. Some areas with moderately deep soils and low rock fragment cover may have rills in the few areas between shrub interspaces in the climax plant community.

2. **Presence of water flow patterns:** Indiscrete and uncommon; probably cover no more than 10% of area; flow paths are very short, usually less than 1 foot in length on high gravel cover sites that have burned. Flow paths are nearly unobservable when shrub canopy is at its highest before burning. Flow paths (>1ft.) and rills (short lived) can occur in the interspaces on moist soils following intense precipitation events; these flow paths are highly sinuous around litter accumlations under shrub canopies. Heavy trailing by livestock and wildlife may lead to extended flow patterns, terracettes and litter dams that are stable once established.

3. **Number and height of erosional pedestals or terracettes:** Pedestals do not exist on most of the site because of high shrub cover or rock fragments. Pedestals and terracettes are uncommon on mod deep soils with low rock cover due to the dominance of shrub cover.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-20%.

5. **Number of gullies and erosion associated with gullies:** Infrequent but these do occur from historic and geologic erosion. Gullies are easily formed if extremely high rainfall events occur 0-15 years after this site burns. Shrub cover

returns to nearly pre-burn levels in 10-15 years.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None present on this site. Canopy gaps > 2-4 feet are very rare on this site.

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7. **Amount of litter movement (describe size and distance expected to travel):** All litter size classes stay in place.

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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):** No slake test done. Expect values of 1-3 in canopy interspaces, and 4 - 6 under plant canopies.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Not applicable. Surface soil organic matter is primarily concentrated under shrub canopies and not easily affected by management.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Cover estimated as: Canopy 50-70%, Basal 5-10%, Litter 60-80% (primarily under shrubs), and Gravel 5-60% (on mod deep soils gravels tend to be < 1/8” diameter); 90-95% of canopy cover is shrubs, 0-1% perennial grasses, 0-1% perennial forbs. Cover is well dispersed throughout site and canopy cover so dense transecting the site often requires stepping on shrubs.

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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 present on this site.

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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 >> trees

    Sub-dominant: succulents >> sub shrubs

    Other: annual forbs > annual grasses > perennial grass

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 10-15% canopy mortality of most shrubs and trees. Some areas have high mortality of juniper and Arizona Cypress due to prolonged drought. Desert buck brush has 80-90 mortality. Pinyon pine has variable mortality across the CRA, primarily on shallower sites and induced by drought and bug kill.

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14. **Average percent litter cover (%) and depth (in):** Litter recover restricted to beneath shrubs.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 805 lbs/acre unfavorable precipitation, 1,310 lbs/acre normal precipitation, 1,827 lbs/acre favorable precipitation.

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:** Red brome, wild oats, and Boer Lovegrass primarily after a fire. Wait-a-bit has a fair representation in the plant community and can increase significantly after fire.

17. **Perennial plant reproductive capability:** All shrubs except desert buckbrush (CEGR) are not affected even following several years of prolonged drought period for region. CEGR has 80-90% canopy mortality.