

## Ecological site R030XD015CA Hyper-Arid Fans

Accessed: 04/30/2024

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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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Date	10/29/2014
Approved by	Jon Gustafson
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

- 1. Number and extent of rills:** Rills are none to few. Rills may increase shortly after intense storms, especially on steeper slopes due to the extremely arid conditions of this site.  

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- 2. Presence of water flow patterns:** Water flow patterns are none to few. Patterns may increase in areas recently subject to intense summer rainfall, on steeper slopes and adjacent to wash areas. Water flow patterns are generally greater than 100 feet apart.  

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- 3. Number and height of erosional pedestals or terracettes:** Pedestals are rare with occurrence typically limited to areas within water flow patterns.  

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- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** There may be as much as 60% bare ground at this site. Areas with lower bare ground percentages usually have higher gravel cover. In general, perennial plant cover is less than 15% with the majority of the remaining cover being some form of bare ground, gravel, cobble or litter cover.  

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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 are no blowouts at this site. Wind scoured areas are somewhat common due to the sparse vegetation cover and high wind storms which generate dust devils. Areas with higher gravel cover may be wind scoured areas. Depositional mounds beneath shrubs and dust devils are common to this site.
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7. **Amount of litter movement (describe size and distance expected to travel):** Fine herbaceous litter is usually moved until it is trapped by vegetation. Intershrub areas are usually devoid of any fine herbaceous litter. Fine woody litter may be moved up to five feet from plants.
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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):** Subsurface and surface areas without any biological crusts can have a soil stability value up to 1. Incipient algal/fungal crusts can have a stability rating between 4 and 5. Biological soil crusts may be under shrubs or in the intershrub spaces.
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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 weak thin platy structure to moderate very thick platy structure with light colors. A horizons are from 1 to 15 centimeters thick with 0 to 0.5 % organic matter.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Shrubs trap eolian material which increase infiltration at the base of the shrubs. Incipient algal/fungal crusts may reduce infiltration in the intershrub spaces while redistributing runoff to the shrub patches. It is possible that this interaction may be critical to the rangeland health of this ecological site. Disturbance of biological soil crust cover has the potential to increase infiltration in the intershrub spaces but because of limited water availability, increased infiltration within the intershrub spaces could lead to decreased plant vigor and may limit seed germination and seedling establishment at this site. The effects of disturbance on biological crusts are not fully understood at this time.
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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. Platy or massive sub-surface horizons, subsoil argillic horizons or hardpans shallow to the surface are not to be interpreted as compacted layers.
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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: Creosote bush > burrobush
- Sub-dominant: Native annual forbs > native annual grasses > perennial grasses
- Other:
- Additional:
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or**

**decadence):** Dead branches within individual shrubs are common. Burrobush and perennial grasses are the first to exhibit mortality during drought. A lack in the presence of annual species, live or standing dead may suggest extreme drought conditions exist where grazing is not present.

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14. **Average percent litter cover (%) and depth ( in):** Litter cover at this site can range from 1 to 15 % and is based on plant material separated from the plant. This litter determination does not include standing dead annual or dead perennial plants. Much of the litter at this site is found beneath plants. If precipitation in the past year has produced an abundance of annuals in the inter-shrub spaces, the percent litter cover can be expected to increase as annuals break down and standing dead capture moving plant debris. Litter is usually very small pieces of plant debris. Trace amounts of some fine woody litter may also be present.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season  $\pm$  150 lbs/ac.
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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:** Potential invaders on this site include red brome, redstem filaree, and Mediterranean grass. Although a potential exists for these species to become invaders, the harsh conditions of this ecological site are likely to prevent dominance by any of these non-native species. In some cases these species may have the potential to exist as a co-dominant.
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17. **Perennial plant reproductive capability:** Droughty conditions greatly restrict abundant seed crops when compared to similar ecological sites at higher elevations. Creosote bush may depend solely on clonal reproduction at this site. Burrobush establishment may depend on favorable years. Also there is sparse vegetation cover which in combination with little seed production greatly limits the perennial plant reproductive capability at this site.
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