

Ecological site R034BY101UT Desert Alkali Bench (Castlevalley saltbush)

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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:** A few rills may be present. A slight increase in rill development may occur immediately following large storm events. Rills should show significant healing during the next one or two growing seasons because of frost-heave recovery and the sites coarse soil textures. Rills present should be < 1 inch deep and may average 5-10 feet in length. A slight increase in rill development may also be observed below adjacent exposed bedrock or other water shedding sites where sufficient water accumulates to cause erosion.
- 2. Presence of water flow patterns:** A few water flow patterns are present. They should be 1 to 2 feet in width, and fairly short (5-10 feet). Waterflow patterns may increase slightly on steeper slopes following large storm events. Biological soil crusts, where present, appear to help stabilize water flow patterns during precipitation events.
- 3. Number and height of erosional pedestals or terracettes:** A few small pedestals (1 to 2 inches) may form at the base of plants that occur on the edge of water flow patterns, they should not show any exposed roots. A few terracettes are common, they may form behind debris dams of small litter (up to 1/2 inch in diameter) in water flow patterns. These debris dams may accumulate small litter (leaves, grass and forb stems) and sediment.
- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 35–45%. (Soil surface is typically covered 5-10% surface fragments). Most bare ground is associated with water flow patterns, rills, and gullies. Poorly developed biological soil crusts that are interpreted as functioning as bare ground should be recorded as bare ground.

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5. **Number of gullies and erosion associated with gullies:** None at site level. Scattered landscape level gully channels, however, are a normal component of desert environments. Where landscape gullies are present, they should be stable, partially vegetated on their sides and bottoms, with no evidence of head-cutting. Some slight increase in disturbance may be evident following significant weather events or when gullies convey considerable runoff from higher elevation rocky or naturally eroding areas.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very little evidence of active wind erosion; blowouts and depositional areas are not present. Slight depositional mounding within perennial grass crowns, under shadscale, castlevaley saltbush, and within biological soil crusts is normal for this site.
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7. **Amount of litter movement (describe size and distance expected to travel):** The majority of litter accumulates in place at the base of plants canopies. Slight movement of the finest material (< 1/8 inch) may move 1 to 2 feet in the direction of prevailing winds or down slope if being transported by water. Minor accumulation may be observed behind obstructions following significant weather events.
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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):** This site should have a soil stability rating of 4 or 5 under plant canopies, and a 3 to 4 in the interspaces. Average should be a 4. Surface textures are typically gravelly loams, gravelly sandy loams, and sandy loams containing up to 10% coarse fragments.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Bandbox Soil surface is typically 0 to 4 inches deep. Surface texture is a sandy loam and structure is moderate thin platy. The A-horizon color is brown (10YR 5/3). Soils have an Ochric epipedon that extends 12 inches into the soil profile. The A horizon is normally deeper and better developed under plant canopies. Use the specific information for the soil you are assessing found in the published soil survey to supplement this description.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial vegetation and any well developed biological soil crusts will break raindrop impact and reduce splash erosion. Good spatial distribution of vascular plants provide increased detention storage and surface roughness that slows runoff, allowing more time for infiltration. Interspaces between plants and any well developed biological soil crusts may serve as water flow patterns during episodic runoff events, with natural erosion expected in severe storms.
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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. An argillic/natric horizon occurs at 12 to 18 inches and should not be mistaken for a compaction layer.
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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: Non-sprouting shrubs (shadscale, castlevaley saltbush) > Cool season perennial bunchgrasses (Indian

ricegrass, bottlebrush squirreltail) > Perennial forbs (scarlet globemallow) > Biological soil crusts.

Sub-dominant: Non-sprouting shrubs (bud sagebrush, green molly) > Rhizomatous grasses (James galleta) > Perennial forbs (woolly plantain).

Other: Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species in the reference state. Biological soil crust is variable in it's expression where present on this site and is measured as a component of ground cover. Forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

Additional: Following a recent disturbance such as fire, drought or insect damage that remove the woody vegetation, forbs and perennial grasses (herbaceous species) may become more dominate in the community. These conditions reflect a community phase within the reference state.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** During years with average to above-average precipitation, there should be very little recent mortality or decadence apparent in either the shrubs or grasses. During severe (multi-year) drought up to 20% of the plants may die. Some mortality of bunchgrass and other shrubs may also occur during severe droughts, particularly on the coarser soils associated with this site. There may be partial mortality of individual bunchgrasses and other shrubs during less severe drought.
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14. **Average percent litter cover (%) and depth (in):** Litter cover ranges from 15 to 20% with a small spike when bud sagebrush drops its leaves. Depth should be 1 leaf thickness in the interspaces and from 1/2 to 3/4 inches under perennial plant canopies.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production in air-dry herbage should be approximately 300 to 400 pounds per acre on an average year. Production could vary from 80 to 535 pounds per acre during drought or above-average 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:** Russian thistle, annual bromes and halogeton are most likely to invade this site.
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17. **Perennial plant reproductive capability:** All perennial plant species have the ability to reproduce in most years except drought years. There are no restrictions on either seed or vegetative reproduction. Some seedling recruitment of major species may be present during average or above average years.
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