

Ecological site R028AY104UT Desert Alkali Bench (Bud Sagebrush)

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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 development may be evident in the reference community following significant storm or snow melt events. The appearance of rills may be more apparent on steeper slopes or where run-on from adjacent upland sites or exposed bedrock concentrate flows. Any rill development will be short (< 3') and widely spaced (6' – 8'). Evidence of rills will disappear in the months following major weather events. Potential rill development may be masked by large concentrations (70% - 80% or greater) of coarse fragments on the soil surface.
- 2. Presence of water flow patterns:** Evidence of water flow is not apparent in the reference community except slight flow activity may be observed following significant weather events. Surface coarse fragments and biological soil crusts typically protect surface soils from accelerated erosion in the reference state. Any flow patterns present are normally <10 feet long, follow natural contours, and are typically spaced 15 to 20 feet apart. There are no exposed roots around perennial grass clumps and surface coarse fragments show little sign of movement or redistribution.
- 3. Number and height of erosional pedestals or terracettes:** Pedestals or terracettes caused by accelerated water erosion are not evident in the reference community. 1 – 3 inches of elevational mounding in James galleta clumps, Bud sage canopies and cryptogamic crusts are normal and may not be water erosion caused.
- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 5% - 15% in the reference community. Ground cover (the inverse of bare ground) typically includes: coarse fragments – 50% to 70%; plant canopy – 10% to 20%; litter – 10% to 15%, and biological soil crusts – 2% to 5%. Bud sage is deciduous and may appear to increase bare ground percentages following

leaf drop.

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5. **Number of gullies and erosion associated with gullies:** Developed gully channels are a normal component of desert environments. Gullies will typically have stable, partially vegetated sides and bottoms with no evidence of recent head-cutting. Some evidence of disturbance may be evident following significant weather events or when gullies convey runoff from higher elevation rocky or naturally eroding areas
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very minor evidence of wind generated soil movement may be present in reference communities. Slight depositional mounding in perennial grass clumps, Bud sage canopies and biological soil crusts is a normal characteristic of this site.
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7. **Amount of litter movement (describe size and distance expected to travel):** Most litter resides in place within or under plant canopies. Some movement of the finest material ($< 1/8''$) may move (1' – 2') in the direction of prevailing winds or down slope if being transported by water. Little accumulation is observed behind obstructions.
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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 3 to 4. Surface textures are typically sandy loams containing 50 to 75% coarse fragments. Where surface soil is lost, increased clay and silt percentages are common in the remaining soil material.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface is 3 or 4 inches deep and structure varies from thin to thick platy. The A-horizon color varies from 10YR 6/2 to 10YR 7/2. It is normally deeper and better developed under plant canopies.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The presence of rhizomatous grasses such as James galleta or Alkali sacaton combined with healthy perennial bunchgrass and Bud sage in the reference community provides for the best infiltration and least runoff from storm events and snow melt. As perennial vegetation decreases and bare ground increases, runoff increases and soil loss is accelerated. Coarse fragments can increase as a percentage of total cover sealing the soil surface and slowing infiltration.
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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. Soils are mostly very deep, but a few may have bedrock at 25 – 30 inches. Increases in clay or silt content in subsoil layers should not be mistaken for compaction.
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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: Dominant: Non-sprouting shrubs (e.g. Bud sage and Shadscale) 40 – 60%, >> warm season perennial grasses (e.g. James galleta, Alkali sacaton, dropseeds) 10 – 20%, > cool season grasses (e.g. Bottlebrush squirreltail and Indian ricegrass) 5 – 10%.

Sub-dominant: Sub-dominant: Mixed shrubs (e.g. Nevada jointfir and Winterfat) 1-5% > Cool season grasses (e.g. Sandberg and Nevada bluegrasses) 1-3%.

Other: Others: Shrubs (e.g. Shortspine horsebrush and Spiny hopsage) 1-3%, perennial forbs (e.g. Scarlet globemallow and Holboell rockcress) 3-5%, biological soil crusts (e.g. lichens, mosses, cyanobacteria).

Additional: Moss and lichen communities will normally be found under plant canopies while the cyanobacteria will be found throughout the site.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Reference community populations should remain relatively stable during average or above average precipitation years. During extreme drought years Bud sage may die and cool season perennial grasses may appear stressed with little production. Broom snakeweed may temporarily increase in percent composition during years with favorable growing conditions for this plant.
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14. **Average percent litter cover (%) and depth (in):** Litter cover ranges from 10 to 15% with a spike when Bud Sage drops its leaves. Depth varies from ¼ - 1/2 inch with depth increasing near plant canopies.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 150 – 250 pounds on a typical year.
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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, Redstem storksbill and Halogeton are likely to increase in or 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. During drought years new seedlings may be missing and principle shrubs may experience early and prolonged leaf drop.
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