USDA Natural Resources
Conservation Service

Ecological site R034BY002UT
Alkali Bottom (Alkali sacaton)

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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:** Rills are normally not present. Some very minor rill development may occur in sparsely vegetated areas. Any rills present should be less than 1/2 inch deep, widely spaced (15 to 20 feet), and not connected. They should average < 15 feet in length. A slight increase in rill development may also be observed following large storm events or spring runoff periods, but should heal within the next year. Rill development may also increase where the site is adjacent to other sites that produce large amounts of runoff (i.e. steeper sites, slickrock, etc.)

2. **Presence of water flow patterns:** None to very few. Any flow patterns present should be sinuous and wind around perennial plant bases. They may be long (15 to 25 feet), < one foot wide, and spaced from 10 to 20 feet apart. They should be stable with only minor evidence of deposition. This site is periodically inundated with runoff water from adjacent sites. It also acts as a filter and trap sediment.

3. **Number and height of erosional pedestals or terracettes:** Plants may show very minor pedestalling where they are adjacent to water flow patterns, but there should be no exposed roots. A few terracettes may be present. Where they are present, they should be stable and occur behind litter blocking water flow patterns.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20 to 25% bare ground. Bare ground openings should not be greater that 1 foot in size and normally should not be connected. Poorly developed biological crusting that functions the same as bare ground, should be recorded as bare ground.

5. **Number of gullies and erosion associated with gullies:** None at site level. Widely 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 little 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.

6. **Extent of wind scoured, blowouts and/or depositional areas:** No evidence of wind generated soil movement. Wind scoured (blowouts) and depositional areas are not present. One to two inches of depositional mounding around black greasewood and perennial grass clumps is normal for this site and is not caused by wind erosion.

7. **Amount of litter movement (describe size and distance expected to travel):** The majority of litter accumulates in place at the base of plant canopies. Slight movement of the finest material (< 1/8 inch) may move 1 to 2 feet in the direction of prevailing winds or downslope if being transported by water. Little accumulation is observed behind obstructions.

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 5 under plant canopies and a rating of 3 to 4 in the interspaces. The average should be 4. Surface textures typically vary from loams silty clay loams.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Green River) Soil surface is typically 0 to 11 inches deep. Surface texture is a loam and structure is weak medium platy. The A-horizon color is brown (10YR 5/3). Soils have an Ochric epipedon that extends 11 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.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial vegetation breaks raindrop impact and reduces splash erosion. Good spatial distribution of plants slows runoff by obstructing surface flows, allowing time for increased infiltration. With the physiographic location of this site being in low lying areas, it often acts as a terminal accumulation site for runoff. The amount of sodium in the soil can reduce the infiltration and facilitate puddling on the surface.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. This site will normally have textural changes within its' profile. These should not be mistaken for compaction layers.

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: Sprouting Shrub (black reasewood) > Perennial Grasses (Alkali sacaton, tufted hairgrass) > Perennial Forbs (fireweed).

Sub-dominant: Sprouting Shrubs (four-wing saltbush, Gardner saltbush > Rhizomatous Grasses (saltgrass) >> Perennial Forbs (shrubby seepweed).

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 its' expression where present on this site and is measured as a component of ground cover. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

Additional: Disturbance regimes include insects, infrequent fire, and flooding. Temporal variability can be caused by fires, droughts, insects, etc. Spatial variability can be caused by runoff, soil pH, and topography. Following a recent disturbance such as fire, drought, or insect damage that remove woody vegetation, forbs and perennial grasses may dominate the community for a time. If a disturbance has not occurred for an extended period of time, woody species may continue to increase on the site, reducing herbaceous species. These conditions may reflect community phases 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 no mortality or decadence in either shrubs or grasses. During severe (multi-year) droughts that affect groundwater levels, up to 10% of the greasewood plants may die. Minor mortality of bunchgrass and other shrubs may also occur during these drought periods. There may be partial mortality of individual bunchgrasses and other shrubs during less severe droughts.

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14. **Average percent litter cover (%) and depth (in):** Litter cover ranges from 25 to 30%. Depth should be 1/4 inch thickness in the interspaces and from 1 to 1.5 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 1680 to 1780 pounds per acre on an average year. Production could vary from 900 to 2500 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, halogeton, mustard species, filarie, other non-native annual forbs and cheatgrass.

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17. **Perennial plant reproductive capability:** All perennial plants should have the ability to reproduce sexually or asexually in most years, except in drought years.
