

## **Ecological site R035XY009UT Alkali Flat (Greasewood)**

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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:** Very minor rill development in exposed areas. If rills are present, they should be widely spaced, and rarely connected. As slopes increase, or on sites adjacent to watersheds or runoff producing areas (i.e. slickrock, steep sites, etc.) rill number and length may increase. Rill development will increase following large storm events, but rills heal within a few years through frost heaving.

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2. **Presence of water flow patterns:** Flow patterns are usually sinuous and wind around perennial plant bases and areas of developed/pinnacled biological crusts. They are expected to be somewhat short (10 to 20 feet), narrow (< 6 inches wide), and widely spaced (20 feet or more). Water flow patterns are stable with only minor evidence of deposition. Evidence of flow patterns will increase somewhat with a slope greater than 3 percent. Deposition in water flow patterns may increase if the site is adjacent to watersheds or runoff producing areas (i.e. slickrock, steep sites, etc.)

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3. **Number and height of erosional pedestals or terracettes:** Plants may show minor pedestalling where they are adjacent to water flow patterns, exposed root should not be apparent. Slight coppice mounding under shrubs is common, and should not be confused with pedestalling. Terracettes should be very few and stable where they have accumulated behind woody debris obstructions in 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):** 15-25%. Ground cover is based on the first raindrop impact, and bare ground is the opposite of ground cover. Ground cover + bare ground = 100%. Poorly developed biological soil crust that is interpreted as functioning as

bare ground and therefore would be susceptible to raindrop splash erosion should be recorded as bare ground.

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5. **Number of gullies and erosion associated with gullies:** Present, but rare. They would usually be expected in locations where there are concentrated flows into the site from an adjacent sites or watersheds. Gullies should show some signs of active erosion often with steep side walls and salts forming on the surface but the bottoms would be mostly stabilized with perennial vegetation. Gullies may show more indication of erosion as the slope gets greater than 3 percent, or as influenced by adjacent steep sites or watersheds that may be providing concentrated flow patterns, or following large storm events.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very minor evidence of wind generated soil movement. Wind scoured (blowouts) and depositional areas are rarely present.

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7. **Amount of litter movement (describe size and distance expected to travel):** Often litter from adjacent sites or watersheds contribute to litter noted on this ecological site. Fine litter removal may occur in flow patterns with deposition occurring at points of obstruction, especially following large storm events. Fine litter movement is expected to increase with slopes over 3 percent. Most litter is often found beneath plant canopies.

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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 or 4 under plant canopies and a rating of 2 to 3 in the interspaces using the soil stability kit test. The average should be a 3. Surface texture varies from loamy sand to silty clay loam. Vegetation cover, litter, and surface rock reduce erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface horizon is typically 1-5 inches deep. Structure is typically weak fine to medium granular. 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:** Vascular plants are expected to break raindrop impact and splash erosion. Spatial distribution of vascular plants slows runoff somewhat by obstructing surface flows to help create sinuous flow patterns that dissipate energy and allow time for some infiltration. The amount of Na in the soil is the overriding factor influencing infiltration. Natural erosion would be expected in severe thunder storms or heavy spring runoff. When perennial grasses decrease, reducing ground cover and increasing bare ground, runoff is expected to increase and any associated infiltration will be reduced.

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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. Due to this sites lower placement (bottoms etc.), it accumulates fine particles such as silts and clays. The associated blocky and massive structures formed from these soil textures often confer naturally occurring hard layers in the soil subsurface. These should not be considered to be compaction 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: Sprouting shrubs with deep tap roots (Greasewood)

Sub-dominant: Perennial grasses (Alkali Sacaton, bottlebrush squirreltail, Galleta) = non-sprouting shrubs (Shadscale, fourwing saltbush) > perennial forbs (globemallow)

Other: Forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species in the reference state (e.g. Crested wheatgrass, Intermediate wheatgrass, etc.)

Biological soil crust is variable in its expression where present on this site and is measured as a component of ground cover.

Additional: Temporal variability is caused by fires, droughts, insects, etc. and spatial variability is caused by adjacency to other sites that produce runoff, soil pH levels, and topography.

Following a recent disturbance such as fire, drought, or insects that removes the woody vegetation, forbs and perennial grasses (herbaceous species) may dominate the community. If a disturbance has not occurred for an extended period of time, woody species may continue to increase crowding out the perennial herbaceous understory species. In either case, 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 that affects groundwater levels, up to 20% of the greasewood plants may die. Some mortality of bunchgrass and other shrubs may also occur during severe droughts. 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 (including under plants) nearly all of which should be fine litter. Depth should be 1 leaf thickness in the interspaces and up to ¼" under canopies. Litter cover may increase to 7-20% on some years due to increased production of annual plants.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 700 - 800 #/acre on an average 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:** Russian thistle, halogeton, mustard, filarie, other native and 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
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