

Ecological site R028AY136UT Desert Sandy Loam (Four-Wing 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:** Minor rill development may be evident in the reference community only following significant storm or snow melt events. The presence of rills may be more evident where run-on from adjacent upland sites or exposed bedrock concentrate flows. Any rill development will be short (< 5') and spaced 6' – 8'. Evidence of rills will decrease in the months following major weather events due to coarse textured surface soils.
- 2. Presence of water flow patterns:** Evidence of water flow is not evident in the reference community except slight flow activity may be observed following significant weather events. Any flow patterns present are normally <15 feet long, follow natural contours, and are typically spaced 15 to 20 feet apart. Healthy vascular plant communities and biological soil crusts reduce runoff and improve infiltration on this site.
- 3. Number and height of erosional pedestals or terracettes:** Pedestals or terracettes caused by accelerated water erosion are not typically evident in the reference community. 1 – 2 inches of depositional mounding in perennial grass clumps and Four-wing saltbush canopies is normal. There are no exposed roots around perennial grass bunches and little evidence of soil or litter accumulating behind obstructions.
- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 20% - 40% in the reference community. Ground cover (the inverse of bare ground) typically includes: coarse fragments – 5% to 15%; plant canopy – 20% to 30%; litter – 20% to 30%, and cryptogamic crusts – 2% to 5%.

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5. **Number of gullies and erosion associated with gullies:** Developed gully channels are a normal component of desert environments. Gullies associated with reference areas will typically have stable, partially vegetated sides and bottoms with no evidence of 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:** Some minor evidence of wind generated soil movement is present in reference communities. Slight depositional mounding around Indian ricegrass and Sand dropseed bunches is a normal characteristic of this site. Slight coppice mounding under Four-wing canopies is normal. Evidence of increased soil saltation may be present during severe drought periods or wind storms.
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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. Larger woody litter ($> 1/4''$) is found under or near shrubs.
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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 to 5. Surface textures are typically sandy loams containing 10% to 15% coarse fragments.
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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 - 4 inches deep and structure varies from granular to weak thick platy. The A-horizon color varies from 5YR 6/8 to 10YR 6/3. Soils have an Ochric epipedon that extends 4 – 10 inches into the soil profile. The A horizon 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 combined with healthy perennial bunchgrasses and Four-wing saltbush 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.
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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 deep to very deep. Increases in clay or silt content in subsoil layers could be mistaken for compaction in some soils.
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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: Sprouting shrubs (e.g. Four-wing saltbush and Winterfat) 20 – 40%, $>$ cool season grasses (e.g. Indian ricegrass and Bottlebrush squirreltail) 20 – 25%.
- Sub-dominant: Sub-dominant: Sprouting shrubs (e.g. Nevada jointfir and Low rabbitbrush) 10 – 15%, $>$ warm season grasses (e.g. Galleta) 2 – 5%, $>$ Short Cool season grasses (e.g. Sandberg and Nevada bluegrasses) 1-3%.

Other: Others: Shrubs (e.g. Bud sage 1-3%), perennial forbs (e.g. Gooseberryleaf globemallow and wild buckwheat) 3-5%, biological crusts (e.g. lichens, mosses, cyanobacteria) trace%.

Additional: Moss and lichen communities will normally be found under plant canopies while the cyanobacteria will be found throughout the site. Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species in the reference state. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

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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. There may be partial (<30%) mortality of individual bunchgrasses and other shrubs during severe drought.
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14. **Average percent litter cover (%) and depth (in):** Litter cover ranges from 20 to 30% with a spike when shrubs drop their leaves. Depth varies from $\frac{3}{4}$ to $\frac{1}{2}$ 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):** 500 - 600 pounds 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:** Broom snakeweed, Russian thistle, Redstem storksbill, annual bromes 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.
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