Ecological site R028AY120UT
Desert Gravelly Loam (Shadscale)

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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 may be evident in the reference community following significant storm or snow melt events. The presence of rills may be more apparent where run-on from adjacent upland sites or exposed bedrock concentrate flows. Any rill development will be short (< 3') and widely spaced (10' – 15'). Evidence of rills will decrease in the months following major weather events as they heal. Potential rill development may be masked by significant concentrations (35 - 60%) of coarse fragments on the soil surface.

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2. **Presence of water flow patterns:** Some evidence of stable overland water flow is apparent in the reference community; increased flow activity may be observed immediately following significant weather events. Flow patterns are normally <20 feet long, follow natural contours, and are typically spaced 10 to 15 feet apart.

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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 under Shadscale canopies is normal and may not be water erosion caused.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 10% - 20% in the reference community. Ground cover (the inverse of bare ground) typically includes: rock fragments – 35% to 60%; plant canopy – 20% to 30%; litter – 10% to 20%.

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5. **Number of gullies and erosion associated with gullies:** Few. Some 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:** Evidence of wind generated soil movement is rare in reference communities. Slight depositional mounding in perennial grass bunches and under Shadscale canopies 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" or less) 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 4 to 5. Surface textures are typically sandy loams containing 35 to 60% rock 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 weak, thin to medium platy. The A-horizon color is typically 10YR 6/2. Soils have an Ochric epipedon that extends 3 – 4 inches into the soil profile. The A horizon is normally deeper and better developed under plant canopies. Where surface soil is lost, increased clay and silt percentages are common in the remaining soil material.

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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 perennial grasses and Shadscale 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. Rock fragments armor 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 deep to very deep. Increases in clay or silt content in subsoil layers could 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. Shadscale and Bud sage) 20 – 30%, > warm season perennial grasses (e.g. James galleta and Sand dropseed) 10 – 20%, > tall cool season grasses (e.g. Indian ricegrass and Bottlebrush squirreltail) 5 – 15%.

Sub-dominant: Sub-dominant: Sprouting shrubs (e.g. Nuttall horsebrush, Nevada jointfir and Winterfat) 5 - 10% > short Cool season grasses (e.g. Bottlebrush squirreltail, Sandberg and Nevada bluegrasses) 3 - 5%.

Other: Others: Shrubs (e.g. Low rabbitbrush and Four-wing saltbush) 1-3%, perennial forbs (e.g. Scarlet globemallow

and Carpet phlox) 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. During severe (multi-year) drought or insect infestations up to 80% of the shadscale may die. There may be partial 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 10 to 20% with a spike when Bud Sage and Shadscale drops its leaves. Depth varies from ¼ - ¾ 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):** 350 – 400 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.
