Ecological site R026XY010NV
LOAMY 10-12 P.Z.

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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:** None on slopes less than 10% (most typical). Short (less than 3 feet) and shallow (less than ½ inch) rills may appear after convective storms or after fast snowmelting events when soils are saturated. These rills should be infrequent across slopes (less than 1 per 20 feet across the slope). Rills may become more frequent on slopes greater than 10% especially if water flow patterns become constricted. They should dissipate 2beyond these constrictions remaining short (less than 3 feet).

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2. **Presence of water flow patterns:** Water flow patterns should be short (less than 3 feet) and disconnected on slopes up to 10% with vegetation breaking and slowing the flow. On slopes greater than 10%, flow patterns may extend to 6 feet, but should be sinuous and not straight. On these steeper slopes they may be more apparent after convective storms or after sudden snow melt when soils are saturated. Flow patterns may be more frequent across slopes than rills, but should be less apparent on flatter landscapes than on steeper.

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3. **Number and height of erosional pedestals or terracettes:** Erosional pedestals should not be present on this ecological site on any slopes. Occasional terracettes may develop at the ends of rills or 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):** Bare ground should be less than 20% and occur in disconnected patches between vegetation and biological soil crusts (mosses and lichens) that are less than 2 feet in diameter. Bare ground may increase around animal burrows and ant discs. Bare ground will increase dramatically the first year after a fire, but after the first two

postfire growing seasons the bare ground should return to less than 20%. Extended droughts may increase bare ground slightly (less than 25%), but should return to below 20% after two normal precipitation years.

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5. **Number of gullies and erosion associated with gullies:** None

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None, except during the first fall after wildfires, before precipitation. Small wind-scoured areas may occur on finer textured soils. Depositional areas may occur in unburned areas on the lea-ward side of the fire, but these should be appear as fine soil particles on litter or biological soil crusts, but should not have measureable depth to them.

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7. **Amount of litter movement (describe size and distance expected to travel):** On slopes less than 10%, all litter should remain in place except in short flow paths where fine litter (less than 1/4 inch) may move up to 3 feet. On steeper slopes, fine litter may move in water flow patterns to the distance of these features (less than 6 feet) on slopes greater than 10%. Woody litter greater than ¼ inch should remain in place.

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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):** Soil stability should be 4-5 in the interspaces and 5-6 under vegetation. Newly disturbed rodent activity may result in values less than 3.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically thin to thick platy, subangular blocky or massive. Soil surface colors are dark grays and the soils are typified by a relatively thin mollic epipedon. Organic carbon of the surface 2 to 4 inches is typically 1.25 to 2.5 percent, dropping off quickly below. Organic matter content can be more or less depending on micro-topography.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., Thurber needlegrass]) slow runoff and increase infiltration. They should be dominant on these sites and spaces nearly 2-3 plants per 10 sq ft. They should be dispersed in the interspaces and not concentrated under shrubs. Shrub canopy, when it occurs, provides opportunity for snow catch and accumulation on site.

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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. Argillic horizons might appear compacted, but should not be platy in appearance and are generally deeper in the soil except on eroded surfaces.

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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: Reference Plant Community: Deep-rooted, cool season, perennial bunchgrasses >> tall shrubs (big sagebrush). (By above ground production)

    Sub-dominant: Deep-rooted, cool season, perennial forbs > associated shrubs = shallow-rooted, cool season, perennial bunchgrasses = fibrous, shallow-rooted, cool season, perennial and annual forbs. (By above ground production)

Other: evergreen trees, succulents. Cover of lichens and mosses should approach that of the minor vascular plant groups.

Additional: After fires, tall shrubs would become minor components for upwards to 20 years especially on drier sites. Cover of lichens and mosses will be reduced to low levels initially after fires, but mosses should increase to pre-fire levels within 10 years of the fire. With an extended fire return interval, the woody component will become dominant and the herbaceous component will be greatly reduced.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs are common and standing dead shrub canopy material may be as much as 25% of total woody canopy; some of the mature bunchgrasses (<20%) have dead centers.

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14. **Average percent litter cover (%) and depth (in):** Litter cover both under vegetation and in interspaces should range between 20-30%. This should be reduced to near zero after a fire, but should return to prefire levels within 2 to 3 years.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (through mid-June) ± 800 lbs/ac; Spring moisture significantly affects total production. Favorable production ±1000 lbs/ac and unfavorable years ± 600 lbs/ac.

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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:** Potential invaders include cheatgrass, halogeton, Russian thistle, annual mustards, and knapweeds. With an extended fire return interval, Utah juniper and singleleaf pinyon will increase on this site and eventually dominate.

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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years. Little growth or reproduction occurs in drought years.
