USDA Natural Resources
Conservation Service

Ecological site R064XY047NE
Very Shallow

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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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Approved by	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Typically, none. Rills may occur on steeper slopes (greater than 15%). When rills do occur, they will be discontinuous.

2. **Presence of water flow patterns:** Typically, none. When water flow patterns are present, they will barely visible and discontinuous.

3. **Number and height of erosional pedestals or terracettes:** Pedestalled plants and terracettes are not expected on gentle slopes but will occur on slopes steeper than 15 percent becoming more evident as slopes increase.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is typically 15 percent or less and bare ground patches will be 2 to 3 inches (5 to 7.5 cm) in diameter.

5. **Number of gullies and erosion associated with gullies:** None. Gullies should not be present.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Wind scoured areas and depositional areas should not be present.

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7. **Amount of litter movement (describe size and distance expected to travel):** Small size litter classes will generally move short distances (less than 6 inches or 12.5 cm), some medium size class litter will move very short distances (less than 3 inches or 6.25 cm). On the steepest slopes (greater than 30 percent) litter will travel greater distances.

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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 aggregate stability ratings should typically 3 or greater. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure for 1 minute or longer when dipped in distilled water.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 4 to 10 inches (10.2 to 25.4 cm) thick gravelly loam. Soil colors range from dark brown to grayish brown (values of 4 to 5) dry and very dark grayish brown to dark grayish brown (vales of 3 to 4) when moist. Structure should typically be weak fine granular at least in the upper A-horizon.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Combination of shallow and deep rooted species (mid and tall rhizomatous and tufted perennial cool season grasses) with fine and coarse roots positively influences infiltration. Infiltration is typically high due to gravelly nature of soils.

    Relative composition is approximately 75 percent grasses or grass-like plants, 15 percent forbs, and 10 percent shrubs and trees. The grass component is composed of 20-40% C4, tall- and midgrasses, 10-20% C3 bunchgrasses, 10-20% C4 shortgrasses, 5-10% C3, rhizomatous grasses, and 5-15% grass-likes.

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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. Site is very shallow to gravel, but no platy structure will be present.

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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: Phase 1.1
    1. Native, perennial, C4, midgrass, 160-320 #/ac, 20-40% (3 species minimum): little bluestem, plains muhly, sideoats grama, sand dropseed.
    2. Native, perennial, C4, shortgrass, 80-240 #/ac, 10-30% (2 species minimum): blue grama, hairy grama, threeawn.
    3. Native, perennial, C3, bunchgrass, 80-200 #/ac, 100-5% (2 species minimum): needle and thread, porcupinegrass, prairie Junegrass, Sandberg bluegrass, bluebunch wheatgrass, Indian ricegrass.

    Phase 1.2
    1. Native, perennial, C4, shortgrass, 125-200 #/ac, 25-40%, (2 species minimum): blue grama, hairy grama, threeawn.
    2. Native grass-like, 100-175 #/ac (20-35%): threadleaf sedge, other sedges.

    Sub-dominant: Phase 1.1
    1. Native grass-likes, 40-120 #/ac, 5-15% (1 species minimum): threadleaf sedge, other sedges.

2. Native forbs, 40-120 #/ac, 5-15% (10 species minimum): cudweed sagewort, dotted gayfeather, hairy goldaster, prairie coneflower, purple coneflower, purple prairie clover, pussytoes, spiny phlox, stemless hymenoxys, and penstemon and other forbs which vary from location to location.

Phase 1.2
1. Native, perennial, C4, tall- and midgrass, 10-75 #/ac, 2-15%, (1 species minimum): little bluestem, sideoats grama, plains muhly, sand dropseed, prairie sandreed.
2. Native forb , 25-75 #/ac, 5-15% (9 species minimum): white sagebrush, dotted blazing star, white heath aster, hairy false goldenaster, pussytoes, scarlet globemallow, spiny phlox, deathcamas, ragwort, and other forbs which vary from location to location.
3. Shrub, 25-75 #/ac, 5-15% (5 species minimum): prairie sagewort, broom snakeweed, soapweed yucca, plains pricklypear, rose and other shrubs which vary from location to location.

Other: Minor - Phase 1.1
1. Native, perennial, C3, rhizomatous grasses, 40-80 #/ac, 5-10%: western wheatgrass, thickspike wheatgrass
2. Shrub, 40-80 #/ac, 5-10%: shrubs present will vary from location to location.
3. Native, perennial, C4, tallgrass, 0-40 #/ac, 0-5%: prairie sandreed.
4. Native, coniferous trees, 0-40 #/ac, 0-5%: Rocky Mountain juniper, ponderosa pine.

Minor - Phase 1.2
1. Native, perennial, C3, bunchgrass, 0-50 #/ac, 0-10%: needle and thread, porcupinegrass, prairie Junegrass, bluebunch wheatgrass, Sandberg wheatgrass, Indian ricegrass.
2. Native, perennial, C3, rhizomatous grass, 5-25 #/ac, 1-5%: western wheatgrass, thickspike wheatgrass.
3. Non-native, C3 grass, 0-50 #/ac (0-10%): cheatgrass, field brome, crested wheatgrass.
4. Native coniferous tree, 0-25 #/ac, 0-5%: Rocky Mountain juniper, ponderosa pine.

Additional: The Needle and Thread-Little Bluestem-Grama Community or Reference Community (1.1) is composed of nine F/S groups. These groups, in order of relative abundance, are native, perennial, C4, midgrass; native, perennial, C4, shortgrass; native, perennial, C3, bunchgrass; native grass-like; native forb; native, perennial, C3, rhizomatous grass; shrub; native, perennial, C4 tallgrass; and native, coniferous tree.

The Blue Grama-Sedge Community (1.2) also consists of nine F/S groups. These groups are, in order of relative abundance, native, perennial, C4 shortgrass; native grass-like; native, perennial, C4, tall- and midgrass; native forb; shrub; native, perennial, C3, bunchgrass; native, perennial, C3, rhizomatous grass; non-native, C3 grass; and native, coniferous trees.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Bunchgrasses have strong, healthy centers with few (less than 3 percent) dead centers. Shrubs may show some dead branches (less than 5 percent) as plants age.

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14. **Average percent litter cover (%) and depth (in):** Plant litter cover is evenly distributed throughout the site and is expected to be 20 to 40 percent and at a depth of approximately 0.25 inch (0.65 cm).

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** The representative value (RV) for annual production is 800 pounds per acre in a year with normal precipitation and temperatures. Low and High production years should yield 400 and 1,100 pounds per acre respectively.

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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:** No non-native invasive species are present. Annual bromes, crested wheatgrass, and eastern red cedar are known invasives that have the potential to become dominant or co-dominant on this site. Consult the state noxious weed and state watch lists for potential invasive species. Note: species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

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17. **Perennial plant reproductive capability:** All perennial species exhibit high vigor relative to recent weather conditions. Perennial grasses should have vigorous rhizomes or tillers; vegetative and reproductive structures are not stunted. All perennial species should be capable of reproducing annually.
