USDA Natural Resources
Conservation Service

Ecological site R066XY062NE
Shallow To Gravel

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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. There may be a slight presence of rills on slopes exceeding 15 percent. When rills are present, they are discontinuous.

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2. **Presence of water flow patterns:** Typically, none. A slight presence of water flow patterns may occur on slopes exceeding 15 percent. When present, water flow patterns are slightly visible, less than 0.5 inches (1.25 cm) deep, 6 inches (15.25 cm) wide, and 5 feet (15.25 meters) long.

3. **Number and height of erosional pedestals or terracettes:** In the hill landscape position bunch grasses may be slightly pedestalled (0.5 inch / 1.25 cm) with no exposed roots; occurrence of pedestalled plants will be rare. This pedestalling will be rare and will occur on slopes exceeding 10 percent with less than 5% of the plants being pedestalled. Drought or wildfire can contribute to increased incidences pedestalled plants.

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 patch sizes will be less than 3 inches (7.6 cm). Multi-year drought and/or wildfire can increase bare ground to 20 to 30 percent for up to two years following the disturbance.

   Bare ground is exposed mineral soil that is not covered by vegetation (basal and/or foliar canopy), standing dead vegetation, gravel/rock, and visible biological crust (e.g., lichen, mosses, algae).

5. **Number of gullies and erosion associated with gullies:** None. Gullies are not expected on this site.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Wind-scoured areas and depositional areas are not expected on this site.

7. **Amount of litter movement (describe size and distance expected to travel):** Small size litter classes will generally move short distances usually less than 12 inches (30 cm). Medium size class litter will move very short distances usually less than 6 inches (15 cm). Coarse litter is not expected to move. Litter debris dams are occasionally present.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability ratings should typically be 5 to 6, normally 6. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color**

and thickness): The A-horizon should be 6 to 15 inches (15.25-38.1 cm) thick and contains 10 to 20 percent fine and medium gravel. Soil colors are dark grayish brown, brown or grayish brown (values 4 to 5) when dry and very dark grayish brown, dark grayish brown, or dark brown (values 3 to 5) when moist. Structure is weak fine granular to single grain in upper A-horizon and single grain, weak coarse prismatic, or weak subangular blocky in the lower A-horizon.

Meadin and Simeon are the primary soil series correlated to the Shallow to Gravel ecological site.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The functional/structural groups provide a combination of rooting depths and structure which positively influences infiltration. Combination of shallow and deep rooted species (warm-season rhizomatous tall- and midgrasses and cool-season bunchgrasses) with fine and coarse roots positively influences infiltration. Woody encroachment may negatively influence infiltration.

    The expected composition of the plant community is 70 to 80 percent perennial grasses and grass-likes, 1 to 5 percent forbs, 5 to 15 percent shrubs, and 1 to10 percent cryptograms. The perennial grass and grass-like component is made up of C4, rhizomatous, tallgrasses (15-35%); C4, midgrasses (10-15%), C3, bunchgrasses (10-20%), C4, shortgrasses (15-25%), C3, rhizomatous grasses (0-5%); and grass-likes (0-5%).

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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. A compaction layer should not 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, tallgrass, 240-560#/ac, 15-35 percent (2 species minimum): prairie sandreed, sand bluestem.
    2. Native, perennial, C4, shortgrasses, 240-400#/ac, 15-25 percent (2 species minimum): blue grama, hairy grama, threeawn.

Phase 1.2
1. Native, perennial, C4, shortgrasses, 165-440#/ac, 15-40 percent (2 species minimum): blue grama, hairy grama, threeawn.
2. Native, perennial, C4, tallgrass, 165-385#/ac, 15-35 percent (1 species minimum): prairie sandreed, sand bluestem.

Sub-dominant: Phase 1.1
1. Native, perennial, C3 bunchgrass, 160-320 #/ac , 10-20 percent (1 species minimum).
2. Native, perennial, C4, midgrass, 160-240 #/ac, 10-15 percent, (2 species minimum).
3. Shrub, 80-240 #/ac, 5-15% (2 species minimum): leadplant, prairie sagewort, broom snakeweed, brittle pricklypear, rose or other shrubs which will vary from location to location.

Phase 1.2
1. Shrub, 55-165 #/ac, 5-15% (2 species minimum): leadplant, prairie sagewort, broom snakeweed, brittle pricklypear, plains pricklypear, rose or other plants which vary from location to location.
2. Cryptogam, 55-165 #/ac, 5-15% (1 species minimum): lesser spikemoss.
3. Native, perennial, C4, midgrass, 11-165 #/ac, 1-15 percent, (2 species minimum): needle and thread, porcupinegrass, green needlegrass, prairie Junegrass.

Other: Minor - Phase 1.1
1. Cryptogam, 0-160 #/ac, 0-10%: lesser spikemoss.
2. Native forb, 16-80#ac, 1-5%: Forbs present vary from location to location.
3. Grass-likes, 0-80 #/ac, 0-5%: sedges.
4. Native, perennial, C3, rhizomatous grasses, 0-80 #/ac, 0-5%: western wheatgrass.

Minor - Phase 1.2
1. Native, perennial, C3 bunchgrass, 55-110 #/ac , 5-10 percent: needle and thread, porcupinegrass, green needlegrass, prairie Junegrass.
2. Grass-likes, 0-110 #/ac, 0-10%: sedges.
3. Native forb, 11-55 #ac, 1-5%: forbs present vary from location to location.
4. Native, perennial, C3, rhizomatous grass, 0-55 #/ac, 0-5%: western wheatgrass.
5. Non-native, C3 grass: 0-55 #/ac, 0-5%: cheatgrass, Kentucky bluegrass.

Additional: The Reference Community or Sand Bluestem-Prairie Sandreed Community (1.1) consists of nine F/S groups. These groups are, in order of relative abundance, native, perennial, C4, tallgrass; native, perennial, C4, shortgrass; native, perennial, C3, bunchgrass; native, perennial, C4, midgrass; shrub; cryptogam; native forb; grass-like = native, perennial, C3, rhizomatous grass. The Club Moss/Prairie Sandreed Community (1.2) includes 10 F/S groups. These groups are, in order of relative abundance, Native, perennial, C4, shortgrass; native, perennial, C4, tallgrass; shrub = cryptogam; native, perennial, C4, midgrass; native,

perennial, C3 bunchgrass; grass-like; native forb; native, perennial, C3 rhizomatous grass = non-native, C3 grass.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Bunch grasses 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 40 to 60 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 1,600 pounds per acre on an air dry weight basis. Low and High production years should yield 1,000 and 2,200 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 (cheatgrass and Japanese/field), common mullein, smooth brome, 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.