USDA Natural Resources
Conservation Service

Ecological site R102CY060NE
SHALLOW CLAY

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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 slopes exceeding 15 percent When present, they will be, short (less than 3 feet or 1 meter), narrow (6 inches or 15 cm), and discontinuous, becoming more apparent as slopes increase.

2. **Presence of water flow patterns:** Typically, none. Water flow patterns may be present on slopes of 15 percent or greater. When present, they will barely be visible and discontinuous with numerous debris dams.

3. **Number and height of erosional pedestals or terracettes:** Typically, none. Pedestals and/or terracettes are not expected to occur on this site. Occasionally, bunch grasses may be pedestalled on slopes greater than 15 percent, with no exposed roots.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 15 percent or less. Bare ground patches should be small (3 inches or 8 cm in diameter) and scattered across the site.

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

5. **Number of gullies and erosion associated with gullies:** Typically, none. Limited headcutting may form after heavy precipitation events. Existing gullies should be stabilized with good vegetative cover.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Wind-scoured and/or 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 size classes generally move short distances (less than 6 inches or 15 cm), some medium size class litter will move very short distances. Litter debris dams are occasionally present.

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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 ratings will be 4 to 6. Surface organic matter adheres to the soil surface. Soil surface is resistant to erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon ranges from 4 to 8 inches (10 to 20 cm) thick. The A-horizon is light brownish gray when dry (hue: 2.5Y, value: 4, chroma: 1) and dark grayish brown when moist (hue: 2.5 Y, value: 4, chroma: 2).

   Soil structure is moderate fine granular in the A-horizon and weak medium subangular blocky parting to weak very fine granular in the AC-horizon.

   See Official Soils Descriptions for additional details; major soil series correlated to the site is Sansarc.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community composition is approximately 80 percent grasses or grass-like plants, 10 percent forbs, 8 percent shrubs, and 2 percent trees which optimizes infiltration on the site. The grass component is composed of cool-season (C3), bunchgrasses, cool-season (C3), rhizomatous grasses, warm-season (C4), tall grasses (C4), mid-grasses, warm-season (C4), short grasses, and grass-likes. The functional/structural groups provide a combination of rooting depths and structure which positively influences infiltration.

    Invasion of introduced cool-season grasses such as Kentucky bluegrass and smooth brome may have an adverse impact infiltration and runoff. Native trees may impact infiltration and runoff if they are present in amounts greater than in the Big Bluestem-Little Bluestem or Reference Community (1.1).

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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. No compaction layers are expected for this site. When dry, the B-horizons can be hard and appear to be compacted, 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, warm-season tallgrass (3 species minimum): big bluestem, Indiangrass, switchgrass, composite

dropseed.
2. Native, perennial, warm-season midgrass (2 species minimum): little bluestem, sideoats grama, prairie dropseed.

Phase 1.2
1. Native, perennial, warm-season midgrass (2 species minimum): little bluestem, sideoats grama, prairie dropseed.
2. Native, perennial, warm-season tallgrass (2 species minimum): big bluestem, Indiangrass, switchgrass, composite dropseed.

Sub-dominant: Phase 1.1
1. Native, perennial, cool-season bunchgrass (3 species minimum): Canada wildrye, green needlegrass, needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.

Phase 1.2
1. Native, perennial, cool-season bunchgrass (3 species minimum): Canada wildrye, green needlegrass, needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.
2. Native, perennial, cool-season rhizomatous grass: western wheatgrass.

Other: Minor - Phase 1.1
1. Native forbs: species present vary from location to location.
2. Grass-likes: sedges.
3. Shrubs: species present vary from location to location.
4. Native, perennial, cool-season rhizomatous grass: western wheatgrass.

Minor - Phase 1.2
1. Native forbs: species present vary from location to location.
2. Grass-likes: sedges.
3. Shrubs: species present vary from location to location.
4. Non-native, cool-season grass: Kentucky bluegrass, smooth brome.

Trace - Phase 1.1
1. Native, perennial, warm-season shortgrass: blue grama, buffalograss.

Trace - Phase 1.2
1. Native, perennial, warm-season shortgrass: blue grama, buffalograss.

Additional: The Big Bluestem-Little Bluestem or Reference Community (1.1) includes eight F/S groups which include in order of relative abundance, native, perennial, warm-season (C4), tallgrass; native, perennial, warm-season (C4), midgrass; native, perennial, cool-season (C3), bunchgrass; native forbs, grass-likes; shrubs = native, perennial, cool-season (C3), rhizomatous grass; native, perennial, warm-season (C4), shortgrass.

The Little Bluestem-Switchgrass Community (1.2) includes nine F/S groups which include in order of relative abundance, native, perennial, warm-season (C4), midgrass; native, perennial, warm-season (C4), tallgrass; native, perennial, cool-season (C3), bunchgrass; native, perennial, cool-season (C3), rhizomatous grass; native forbs, grass-likes; shrubs = non-native, perennial, cool-season grass; and native, perennial, warm-season (C4), shortgrass.

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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 65 to 75 percent and at a depth of 0.50 to 1.0 inch (1.3-2.6 cm). Kentucky bluegrass excessive litter can negatively impact the functionality of this site.

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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 2,250 pounds per acre in a year with normal precipitation and temperatures. Low and High production years should yield 1,800 and 2,700 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, Kentucky bluegrass, smooth brome, Canada thistle, and eastern redcedar 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 climatic 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.
