USDA Natural Resources
Conservation Service

Ecological site R064XY002NE
Wet Subirrigated

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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:** None. Rills should not be present.

2. **Presence of water flow patterns:** None. Water flow patterns should not be present.

3. **Number and height of erosional pedestals or terracettes:** None. Pedestals or terracettes should not be present.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is typically less than 5 percent.

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.

7. **Amount of litter movement (describe size and distance expected to travel):** None. Litter falls into place. Litter movement is not expected on this site.

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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 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.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The thickness of the A-horizon varies significantly with soil series and ranges from 6 to 50 inches (15 – 127 cm) thick. Soil colors may be very dark gray, dark gray, gray, or grayish brown (10YR 2 to 6/0, 1 or 2 or 2.5Y 3/2 or 5Y 4/1) when dry and black, very dark gray, dark gray, very dark grayish brown (10YR 2 to 4/1 or 2 or 5Y 3/1 or N 2.5/) when moist.

   Soil structures are weak fine subangular blocky parting to weak fine granular, weak medium subangular blocky parting to weak fine granular, moderate fine prismatic structure parting to moderate fine subangular blocky weak fine or weak fine and medium granular, or weak thin platy.

   See Official Soils Descriptions for additional details; major soil series correlated to the site are Calco, Arlo, Barney, Kezan, James, Loup, Zook, Baltic, Norway, Clarno, Clamo, Colo, and Lamo.

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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. Invasion of introduced cool-season grasses such as reed canarygrass and creeping foxtail may have an adverse impact infiltration and runoff.

    Plant community composition is approximately 80-95 percent grasses or grass-like plants, 5 to 10 percent forbs, and 0-5 percent shrubs and trees which optimizes infiltration on the site. The grass and grass-like component is composed of warm-season (C4), tallgrass, grass-likes, cool-season (C3) bunchgrasses, cool-season (C3) rhizomatous grasses, and warm-season (C4), midgrass.

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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):** Typically, none. Physical impact during wet or ponded periods may cause temporary compaction, but this limited compaction will not restrict root development in the reference state.

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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 (4 species minimum): big bluestem, switchgrass, Indiangrass, composite dropseed, prairie cordgrass.
    2. Grass-likes (4 species minimum): rushes, sedges, bullrushes, spike-sedges.

    Phase 1.2
    1. Native, perennial, warm-season tallgrass (3 species minimum): big bluestem, switchgrass, Indiangrass, prairie cordgrass.
    2. Grass-likes (4 species minimum): rushes, sedges, bullrushes, spike-sedges.

Sub-dominant: Phase 1.1
1. Native, perennial, cool-season bunchgrass (2 species minimum): bluejoint reedgrass, northern reedgrass, plains bluegrass.

Phase 1.2
1. Native, perennial, cool-season bunchgrass (2 species minimum): bluejoint reedgrass, northern reedgrass, plains bluegrass.
2. Native, perennial, cool-season, rhizomatous grass (1 species minimum): western wheatgrass, reed canarygrass.
3. Native, perennial, warm-season midgrass: little bluestem, sideoats grama.

Other: Minor - Phase 1.1
1. Native, perennial, cool-season, rhizomatous grass: western wheatgrass, reed canarygrass.
2. Native, perennial, warm-season midgrass: little bluestem, sideoats grama
3. Native forbs: forbs present vary from location to location.
4. Shrubs: willows, indigobush, and other shrubs that vary from location to location.

Minor - Phase 1.2
1. Native forbs: forbs present vary from location to location.
2. Shrubs: shrubs present vary from location to location.

Additional: The Big Bluestem – Switchgrass - Indiangrass Community or Reference Community (1.1) includes seven F/S groups which include in order of relative abundance, native, perennial, warm-season tallgrass; grass-likes; native, perennial, cool-season, bunchgrass; native, perennial, cool-season, rhizomatous grass; native, perennial, warm-season midgrass; native forbs; and shrubs.

The Prairie Cordgrass – Switchgrass Community (1.2) includes seven F/S groups which include in order of relative abundance, native, perennial, warm-season tallgrass; native, perennial, cool-season bunchgrass; grass-likes; native, perennial, cool-season, rhizomatous grass; native, perennial, warm-season mid-grass; native forbs; and shrubs.

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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 60 to 75 percent and at a depth of approximately 0.25 to 0.5 inch (0.65 to 1.3 cm). Reed canarygrass, creeping foxtail, and other cool-season introduced grass excessive litter can negatively impact the functionality of the 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 5,750 pounds per acre in a year with normal precipitation and temperatures. Low and High production years should yield 5,250 and 6,250 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. Reed canarygrass, creeping foxtail, leafy spurge, quackgrass, and Canada thistle 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.
