

Ecological site R064XY024NE

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 are not expected on this site.
2. **Presence of water flow patterns:** None. Water flow patterns are not expected on this site.
3. **Number and height of erosional pedestals or terracettes:** None. Pedestals or terracettes are not expected on this site.
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.

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter should fall in 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. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain their 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 A-horizon should be 4 to 15 inches (10.2 to 38 cm) thick. Soil colors range from very dark gray, dark gray, dark grayish brown, to gray (values of 3 to 5) when dry and black, very dark grayish brown, to dark gray (values of 2 to 4) when moist. Structure typically is medium to fine granular 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. Invasion of introduced cool-season grasses such as Kentucky bluegrass and annual brome may have an adverse impact infiltration and runoff.
- Relative composition is approximately 80 percent grasses or grass-like plants, 10 percent forbs, and 10 percent shrubs. The grass and grass-like component is composed of C4 tall, rhizomatous grasses (40-60%), C4, mid, bunch grasses (10-20%), C3, bunch grasses (0-10%), C3, rhizomatous grasses (0-10%), and grass-likes (5-10%).
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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.
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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, 1720-2570 #/ac, 40-60% (4 species minimum): big bluestem, Indiangrass, prairie cordgrass, sand bluestem, switchgrass.
- Phase 1.2
1. Native, perennial, C4, tallgrass, 450-1200 #/ac, 15-40% (3 species minimum): big bluestem, prairie cordgrass, Indiangrass, switchgrass, sand bluestem.
- Phase 1.3
1. Native grass-likes, 180-720 #/ac, 5-20% (1 species minimum): sedge, bulrush, rush, spikerush.
- Sub-dominant: Phase 1.1
1. Native, perennial C4, midgrasses, 430-860 #/ac, 10-20% (1 species minimum): alkali sacaton, little bluestem.
- Phase 1.2
1. Native, perennial, C4, midgrass, 150-600 #/ac, 5-20% (1 species minimum): little bluestem, alkali sacaton.
2. Native grass-likes, 150-600 #/ac, 5-20% (1 species minimum): sedge, bulrush, rush, spikerush.
3. Native perennial, C3 rhizomatous grass, 150-450 #/ac, 5-15% (1 species minimum): western wheatgrass.

Phase 1.3

1. Non-native C3 grass, 180-540 #/ac, 5-15% (1 species minimum): smooth brome, cheatgrass, field brome.

Other: Minor - Phase 1.1

1. Native, grass-like, 215-430 #/ac (5-10%): Baltic rush, bulrush, rush, sedge, spikerush.
2. Native, perennial and annual forbs, 215-430 #/ac (5-10%): forbs present will vary with location.
3. Native, perennial, C3, bunchgrass, 0-430 #/ac (0-10%): foxtail barley, Canada wildrye, slender wheatgrass, needle and thread.
4. Native, perennial, C3, rhizomatous grasses, 0-430 #/ac (0-10%): western wheatgrass, marsh muhly.
5. Shrubs, 0-215 #/ac (0-5%): shrubs present will vary from location to location.
6. Native deciduous trees, 0-215 #/ac, 0-5%: willow

Minor - Phase 1.2

1. Non-native, C3 grass, 0-300 #/ac, 0-10%: smooth brome, cheatgrass, field brome.
2. Native, perennial, C3, bunchgrass, 0-150 #/ac, 0-5%: foxtail barley, spiked muhly, needle and thread.
3. Native, perennial and annual forbs, 150-300 #/ac, 5-10%: forbs present vary from location to location.
4. Shrubs, 0-150 #/ac, 0-5%: shrubs present vary from location to location.
5. Native deciduous trees, 0-150 #/ac, 0-5%: willow.

Minor - Phase 1.3

1. Native, perennial, C4, tallgrass, 180-360 #/ac, 5-10%: big bluestem, prairie cordgrass, Indiangrass, switchgrass, sand bluestem.
2. Native, perennial, C4, midgrass, 180-360 #/ac, 5-10%: little bluestem, alkali sacaton.
3. Native, perennial and annual forbs, 180-360 #/ac, 5-10%: forbs present vary from location to location.
4. Native, perennial, C3, rhizomatous grasses, 0-360 #/ac, 0-10% (1 species minimum): western wheatgrass.
5. Native, perennial, C3, bunchgrass, 0-360 #/ac, 0-10%: foxtail barley, spiked muhly.
6. Shrubs, 0-180 #/ac, 0-5%: shrubs present vary from location to location.
7. Native deciduous trees, 0-360 #/ac, 0-5%: willow.

Additional: The Reference Community or Big Bluestem-Little Bluestem-Indiangrass-Prairie Cordgrass includes eight F/S groups. These groups, in order of abundance, include native, perennial, rhizomatous, C4, tallgrass; native, perennial, C4, mid-, bunchgrass, native, grass-like = native, perennial and annual forbs; native, perennial C3, rhizomatous grasses = native, perennial, C3, bunchgrass; shrubs = native trees.

The Little Bluestem-Rhizomatous Wheatgrass/Sedge Community (1.2) includes nine F/S groups. These groups, in order of abundance, include native, perennial, C4, rhizomatous, tallgrass; native, perennial, C4, mid, bunchgrass = native grass-like; native, perennial, C3, rhizomatous grasses; native, perennial and annual forbs; non-native C3 grass, native, perennial, C3 bunchgrass = shrubs = native trees.

The Excessive Litter Community (1.3) includes nine F/S groups. The dominant group is grass-like while the subdominant group is non-native, C3 grasses.

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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 80 to 90 percent and at a depth of 0.50 to 1 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):** Annual-production is 4,300 pounds per acre in a year with normal precipitation and temperatures. Low and High production years should yield 3,500 and 5,000 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, quackgrass, reed canarygrass, saltcedar, and Russian olive 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.
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