

## Ecological site R066XY032NE Sandy 18-22" P.Z.

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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:** Typically, none. Water flow patterns are not expected on gentle slopes. On steeper slopes (greater than 15 percent) water flow patterns may occur but will be barely visible and discontinuous.

3. **Number and height of erosional pedestals or terracettes:** Typically, none. Bunchgrasses may be slightly pedestalled (0.5 inch/1.25 cm) with no exposed roots on steeper slopes (greater than 15 percent), becoming more common as slopes become steeper.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is typically 5 percent or less. Multi-year drought and/or wildfire can increase bare ground to 10 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.

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter should fall in place. Slight amount of movement of fine litter (less than 12 inches) from water is possible, but not normal. Litter movement from wind is not expected.

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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 A-horizon should be 7 to 20 inches (17.8-50.8 cm) thick, with the deeper A-horizon occurring on interdunes and nearly level landscape positions. Soil is dark grayish brown to grayish brown (values of 4 to 5) when dry and very dark brown, very dark grayish brown, to dark grayish brown (values of 2 to 4) when moist. Structure is typically weak medium and coarse subangular blocky parting to weak fine medium to fine granular or moderate medium granular structure.

The primary soil series correlated to this site are Anselmo and Holt.

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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 (mid & tall rhizomatous and tufted perennial cool-season grasses) with fine and coarse roots positively influences infiltration. Invasion of introduced cool-season grasses such as annual bromes, Kentucky bluegrass, and smooth brome may have an adverse impact on infiltration and runoff. Woody encroachment may also negatively influence infiltration.

The expected composition of the plant community is 80 to 85 percent perennial grasses and grass-like, 5 to 10 percent forbs, and 5 to 10 percent shrubs. The perennial grass and grass-like component is made up of C4, rhizomatous, tallgrasses (35-50%); C4, midgrasses (10-30%); C3, bunchgrasses (10-20%); C4, shortgrasses (5-10%); C3, rhizomatous grasses (0-5%); and grass-like (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. 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: 840-1200 #/ac, 35-50% (3 species minimum): big bluestem, Indiangrass, prairie sandreed, sand bluestem, switchgrass.

2. Native, perennial, C4 midgrass: 240-720 #/ac, 10-30% (2 species minimum): little bluestem, sand dropseed, sand lovegrass, sideoats grama, purple lovegrass.

#### Phase 1.2

1. Native, perennial, C4 tallgrass: 700-1200 #/ac, 35-60% (4 species minimum): big bluestem, Indiangrass, prairie sandreed, sand bluestem, switchgrass.
2. Native, perennial, C4 midgrass: 200-700 #/ac, 10-35% (1 species minimum): little bluestem, sand dropseed, sideoats grama, purple lovegrass.

#### Phase 1.3

1. Native, perennial, C4, shortgrass, 280-490 #/ac, 20-35% (1 species minimum): blue grama, hairy grama, thin paspalum.
2. Native, perennial, C3, bunchgrass, 140-350 #/ac, 10-25% (2 species minimum): fall rosette grass, needle and thread, prairie Junegrass, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.

#### Sub-dominant: Phase 1.1

1. Native, perennial, C3 bunchgrass, 240-480 #/ac, 10-20% (2 species minimum): fall rosette grass, Indian ricegrass, needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosette grass.

#### Phase 1.2

1. Native, perennial, C3 bunchgrass, 100-300 #/ac, 5-15% (1 species minimum): fall rosette grass, needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosette grass.
2. Native, perennial, C4, shortgrass, 100-300 #/ac, 5-15% (1 species minimum): blue grama, hairy grama, thin paspalum.
3. Native, perennial, C3, rhizomatous grass, 0-300 #/ac, 0-15% (1 species minimum): western wheatgrass.

#### Phase 1.3

1. Native, perennial, C3, rhizomatous grass, 70-280 #/ac, 5-20% (1 species minimum): western wheatgrass
2. Native, perennial, C4 midgrass, 70-210 #/ac, 5-15% (1 species minimum): little bluestem, sand dropseed, purple lovegrass.
3. Native perennial, C4, tallgrass, 70-210 #/ac, 5-15% (1 species minimum): big bluestem, prairie sandreed, sand bluestem, switchgrass.
4. Grass-like, 70-210 #/ac, 5-15% (1 species minimum): sedges.

#### Other: Minor - Phase 1.1

1. Grass-like, 120-240 #/ac, 5-10%: sedges.
2. Native, perennial, C4, shortgrass, 120-240 #/ac, 5-10%: blue grama, hairy grama, thin paspalum, Fendler threeawn
3. Native forb, 120-240 #/ac, 5-10%: Forbs vary from location to location.
4. Shrub, 24-120 #/AC, 1-5%: Shrubs present from location to location.
5. Native, perennial, C3, rhizomatous grass, 0-120 #/ac, 0-5%: western wheatgrass.

#### Minor -Phase 1.2

1. Native forbs, 100-200 #/ac, 5-10%: forbs vary from location to location.
2. Shrub, 20-200 #/ac, 1-10%: shrubs vary from location to location.
3. Grass-like, 0-200 #/ac, 0-10%: sedges.
4. Non-native, C3 grass, 0-200 #/ac, 0-10%: Kentucky bluegrass, cheatgrass.

#### Minor -Phase 1.3

1. Forb, 70-140 #/ac, 5-10%: forbs vary from location to location.
2. Shrub, 14-140 #/ac, 1-10%: shrubs vary from location to location.
3. Non-native, C3 grass, 0-140 #/ac, 0-10%: Kentucky bluegrass, cheatgrass.
4. Native, Annual grass, 0-70 #/ac, 0-5%: mat sandbur

#### Trace - Phase 1.2

1. Trees, 0-40 #/ac, 0-2%: eastern redcedar, boxelder, ponderosa pine, green ash.

#### Trace - Phase 1.3

1. Trees, 0-28#/ac, 0-2%: eastern redcedar, ponderosa pine, green ash, boxelder.

Additional: The Reference Community (1.1) includes eight F/S groups which are, in order of relative abundance, native, perennial, C4 tallgrass; native, perennial, C4 midgrass, native, perennial, C3 bunchgrass; native, perennial, C4 shortgrass = grass-likes = native forbs; shrubs; and native C3 rhizomatous grass.

The Degraded Native Grass Community (1.2) includes ten F/S groups which include native, perennial, C4 tallgrass; native, perennial, C4 midgrass, native, perennial, C3 bunchgrass = native, perennial, C4 shortgrass; native C3 rhizomatous grass; native forbs; shrubs; grass-likes; non-native C3 grass; native trees.

The At-Risk Community (1.3) includes eleven F/S groups which include native, perennial, C4 shortgrass; native, perennial, C4, tallgrass = native, perennial, C4 midgrass; native, perennial, C3 bunchgrass; native, perennial, C3 rhizomatous grass; grass-likes; non-native, C3 grass; native forbs; shrubs; native annual grass; and tree

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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 60 to 80 percent and at a depth of 0.25 to 0.50 inch (0.65-1.3 cm). Litter cover during and following drought can range from 50 to 60 percent.
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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 2,400 pounds per acre on an air dry weight basis. Low and High production years should yield 1,800 and 3,000 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 (cheatgrass and Japanese/field), leafy spurge, absinth wormwood, sulphur cinquefoil, eastern redcedar, Canada thistle, common mullein, Kentucky bluegrass 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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