USDA Natural Resources
Conservation Service

Ecological site R071XY029NE
Loamy Overflow

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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 and terracettes are not expected to occur 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 5 percent or less. 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 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 and depositional areas are not expected on this site.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter may move short distances (less than 6 inches or 15 cm) following a significant run-off event; as interspaces are small, there is no difference between litter movement in interspaces and under canopy. Coarse litter generally does not move.

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 5 to 6, typically 6. Interspaces are quite small and there should be no difference between interspaces and under canopy. High root content and organic matter will be present in the soil surface.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A-horizon is 7 inches thick, grayish brown (10YR 5/2) to very dark grayish brown (10YR 3/2) moist with a weak medium granular structure.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community composition of 80 to 90 percent perennial grasses and grass-likes, 3 to 10 percent forbs, 1 to 5 percent shrubs, and 0 to 1 percent trees will optimize infiltration on the site. The grass and grass-like component is made up of native, perennial, warm-season, tall, rhizomatous grasses (35-50%), native, perennial, warm-season, mid-grasses (25-35%), native, perennial, cool-season grasses (5-10%), native, perennial, warm-season, short grasses (1-5%), and grass-likes (1-2%).

    Infiltration can be adversely impacted by the invasion of Kentucky bluegrass, smooth brome, tall fescue, and trees when present above 10 percent (subdominant designation).

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 occur naturally on this site.

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, 1400--2000 #/ac, 35-50%, (3 species minimum): big bluestem, switchgrass, Indiangrass, composite (tall) dropseed.

    Phase 1.2
    1. Native, perennial, warm-season midgrass, (2 species minimum): little bluestem, sideoats grama.

    2. Native, perennial, warm-season tallgrass, (2 species minimum): big bluestem, switchgrass, Indiangrass, composite (tall) dropseed.

    Phase 1.3
    1. Native, perennial, warm-season tallgrass, (2 species minimum): big bluestem, switchgrass, Indiangrass, composite (tall) dropseed.

    2. Native, perennial cool-season grass, (1 species minimum): western wheatgrass, needle and thread, porcupinegrass, Scribner's rosette grass, Canada wildrye, prairie Junegrass.

Sub-dominant: Phase 1.1
1. Native, perennial, warm-season midgrass, 1000-1400 #/ac, 25-35%, (2 species minimum): little bluestem, sideoats grama.

Phase 1.2
1. Native, perennial, warm-season shortgrass, (1 species minimum): blue grama.

2. Native, perennial cool-season grass, (1 species minimum): western wheatgrass, needle and thread, porcupinegrass, Scribner's rosette grass, Canada wildrye, prairie Junegrass.

Phase 1.3
1. Native, perennial, warm-season midgrass, (2 species minimum): little bluestem, sideoats grama.

Other: Minor - Phase 1.1
1. Native, perennial, cool-season grass, 200-400 #/ac, 5-10%: western wheatgrass, needle and thread, porcupinegrass, Scribner's rosette grass, Canada wildrye, prairie Junegrass.

2. Native, perennial, warm-season shortgrass, 40-200 #/ac, 1-5%): blue grama.

3. Native forb (perennial and annual), 120-400 #/ac, 3-10%: species present will vary from location to location.

4. Shrub, 40-200 #/ac, 1-5%: leadplant, prairie rose, western snowberry, smooth sumac.

Minor - Phase 1.2
1. Native forb: species present will vary from location to location.

2. Shrubs: prairie rose, western snowberry, smooth sumac.

Minor - Phase 1.3
1. Native, perennial, warm-season shortgrass: blue grama.

2. Native forb: species present will vary from location to location.

3. Grass-likes: sedges.

Trace - Phase 1.1
1. Grass-like, 40-80 #/ac, 1-2%: sedges.

2. Deciduous trees, 0-40 #/ac, 0-1%: eastern cottonwood, green ash.

Trace - Phase 1.2
1. Grass-likes: sedges.

2. Deciduous trees: eastern cottonwood, green ash.

Trace - Phase 1.3
1. Shrubs: western snowberry, smooth sumac.

2. Deciduous trees: eastern cottonwood, green ash.

Additional: The Reference Community (1.1) includes eight F/S Groups. These groups in order of abundance are native, perennial, warm-season, tallgrass; native perennial, warm-season midgrass; native, perennial, cool-season grass;

native, perennial, warm-season shortgrass; grass-likes; native forbs (perennial and annual), and shrubs.

The Degraded Native Grass Community (1.2) also includes eight S/F Groups. These groups in order of abundance are native, perennial, warm-season midgrass; native, perennial, warm-season tallgrass; native, perennial, warm-season shortgrass; native forbs, shrubs, grass-likes, and deciduous trees.

The Excessive Litter Community (1.3) includes eight S/F Groups. These groups in order of abundance are native, perennial, warm-season, tallgrass; native, perennial, cool-season grass; native, perennial, warm-season, midgrass; native, perennial, warm-season, shortgrass; native forbs, grass-likes, sedges, shrubs, and deciduous trees

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** A few (less than 3 percent) dead centers may occur in bunchgrasses. Shrubs may show some (less than 5 percent) dead branches 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 90 to 95 percent and at a depth of 0.75 inches (1.9 cm). Kentucky bluegrass excessive litter or tree encroachment 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):** Production is shown in air-dry values. The Representative Value (RV) = 4,000 pounds per acre. Low production years = 3,500 pounds per acre. High production years = 4,500 pounds per acre.

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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. Kentucky bluegrass, smooth brome, Caucasian bluestem, eastern redcedar, honey locust, nodding plumeless thistle (musk thistle), Canada thistle, common mullein, and Sericea lespedeza are known invasives that have the potential to be dominant or co-dominant on the site. Consult the state noxious weed and state watch lists for potential invasive species on each ecological site. NOTE: Invasive plants (for the purposes of the IIRH protocol) are plant species that are typically not found on the ecological site or should only be in trace or minor categories under the natural disturbance regime and have the potential to become a dominant or codominant species on the site if their establishment and growth are not actively controlled by natural disturbances or management interventions. Species listed characterize degraded states AND have the potential to become a dominant or co-dominant species

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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.
