

Ecological site R102CY061NE SHALLOW LIMY

Last updated: 12/10/2024 Accessed: 05/12/2025

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.

Author(s)/participant(s)	Nadine Bishop, Emily Helms, Jeff Nichols
Contact for lead author	jeffrey.nichols@usda.gov
Date	12/04/2024
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.
- Presence of water flow patterns: Typically, none. Water flow patterns may be present on slopes of 15 percent or greater. When present they are rare, slightly visible, less than 0.5 inches (1.25 cm) deep, less than 6 inches (15.25 cm) wide, and less than 1 foot (30.5 cm) long becoming more apparent as slopes increase. When present they are disconnected and disrupted by perennial vegetation.
- 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 typically 10 percent or less and patch sizes will be less than 3 inches (7.6 cm). Multi-year drought or wildfire may increase bare ground to 20 to 30 percent with patches of 6 inches or 15 cm for two years following the disturbance.

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 and associated erosion are not expected on this site.
- 6. Extent of wind scoured, blowouts and/or depositional areas: None. Wind-scoured and/or depositional areas should not be present.
- 7. Amount of litter movement (describe size and distance expected to travel): Typically, none. Litter movement is not expected on slopes of 15 percent or less. As slopes become steeper, small size litter classes will generally move short distances usually less than 12 inches (30 cm). Medium size class litter will move very short distances usually less than 6 inches (15 cm). Coarse litter is not expected to move. Litter debris dams are occasionally present.
- 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. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.
- 9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): A-horizon ranges from 3 to 5 inches (10 to 20 cm) thick in Gavins soils and 10 to 14 inches thick in Bluemound soils. The A-horizon is dark gray or very dark gray when dry (hue: 10YR, value: 3 or 4, chroma: 1 or 2) and very dark grayish brown or black when moist (hue: 10YR, value: 1 or 3, chroma: 1 or 2).

Structure is weak fine granular to very fine granular. Siltstone fragments are in all parts of the solum in Gavins soils. Siltstone (Gavins soils) or quartzite (Bluemound) bed rock is present at a depth of 10 to 20 inches (40 to 80 cm).

See Official Soils Descriptions for additional details; the major soil series correlated to the site are Bluemound and Gavins.

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 perennial grasses and grass-likes, 10 percent forbs, and 10 percent shrubs which optimizes infiltration on the site. The perennial grass and grass-like component is made up of warm-season (C4), rhizomatous, tall grasses, warm-season (C4), mid-grasses, cool-season (C3), bunch grasses, warm-season (C4), short grasses, cool-season (C3), rhizomatous 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. Woody encroachment of native tree species may also negatively impact infiltration and runoff. Under some management regimes, short grass and threadleaf sedge sod may develop which will also negatively influence infiltration.

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. There is a naturally occurring restrictive layer (siltstone) at 10 to 20 inches (25 to 50 cm).

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, prairie sandreed, sand bluestem, switchgrass, composite dropseed.

2. Native, perennial, warm-season, midgrass (4 species minimum): Little bluestem, sideoats grama, plains muhly, purple lovegrass, sand dropseed.

Phase 1.2

1. Native, perennial, warm-season, midgrass (2 species minimum): Little bluestem, sideoats grama, plains muhly, purple lovegrass, sand dropseed.

2. Native, perennial, warm-season tallgrass (2 species minimum): Big bluestem, Indiangrass, prairie sandreed, sand bluestem, switchgrass, composite dropseed.

Sub-dominant: Phase 1.1

1. Native, perennial, cool-season bunchgrass (4 species minimum): Needle and thread, porcupinegrass, green needlegrass, Canada wildrye, Scribner's rosettegrass, fall rosettegrass, prairie Junegrass.

2. Native, perennial, warm-season, shortgrass (1 species minimum): Blue grama, buffalograss, hairy grama, threeawn.

Phase 1.2

1. Native, perennial, cool-season bunchgrass (2 species minimum): needle and thread, porcupinegrass, green needlegrass, Canada wildrye, Scribner's rosettegrass, fall rosettegrass, prairie Junegrass.

2. Native, perennial, warm-season, shortgrass (1 species minimum): Blue grama, buffalograss, hairy grama, threeawn.

3. Native, perennial, cool-season, rhizomatous grass (1 species minimum): western wheatgrass.

Other: Minor - Phase 1.1

1. Forbs: Forbs present will vary from location to location.

2. Native, perennial, cool-season, rhizomatous grass: western wheatgrass.

- 3. Grass-likes: Sedges, threadleaf sedge.
- 4. Shrubs: shrubs present will vary from location to location.

Minor - Phase 1.2

- 1. Forbs: Forbs present will vary from location to location.
- 2. Grass-likes: Sedges, threadleaf sedge.
- 3. Shrubs: shrubs present will vary from location to location.
- 4. Native trees: Eastern redcedar, ponderosa pine, and other trees which vary from location to location.

Trace - Phase 1.1

1. Native trees: Eastern redcedar, ponderosa pine, and other trees which vary from location to location.

Additional: The Big Bluestem-Sideoats Grama or Reference Community (1.1) includes nine 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, perennial, warm-season (C4), shortgrass; native forbs, native, perennial, cool-season (C3), rhizomatous grass; grass-likes; shrubs; and native trees.

The Little Bluestem-Sideoats Grama 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), rhizomatous grass; native, perennial, warm-season (C4) shortgrass; native forbs, grass-likes; shrubs; and native trees.

- 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.
- 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).
- 15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annualproduction): The representative value (RV) for annual production is 2,000 pounds per acre in a year with normal precipitation and temperatures. Low and High production years should yield 1,250 and 2,500 pounds per acre respectively.
- 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, common mullein, 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 species 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.
- 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.