USDA Natural Resources
Conservation Service

Ecological site R064XY012NE
Sands

Last updated: 12/16/2024
Accessed: 05/13/2025

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.

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Date	12/16/2024
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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:** Typically, none. Water flow patterns may be present on slopes of 15% or greater. When present, they will be no longer than 2 to 4 inches (5 to 10 cm), less than 3 inches (7.5 cm) wide, and discontinuous. Water flow patterns, when present, are often associated with animal activity.

3. **Number and height of erosional pedestals or terracettes:** Bunch grasses may be slightly pedestalled (0.5 inch or 1.25 cm) with no exposed roots; occurrence of pedestalled plants will average less than one per square meter. This typically will occur on north and west aspects of slopes exceeding 10 percent and where bunchgrasses are more common. Drought or wildfire can contribute to increased incidences of 1 to 3 pedestalled plants per square meter.

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 15 percent, and bare ground patches are less than 2 to 3 inches (5 to 7.5 cm) in diameter.

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:** Occasional areas associated with increased animal activity (e.g., rodent burrows, animal trailing) may exhibit small wind scoured areas, typically less than 10 feet (3 m) in diameter. Small wind scoured areas may also occur immediately adjacent to areas receiving repeated disturbance.

7. **Amount of litter movement (describe size and distance expected to travel):** Litter should fall in place. Slight amount of movement (less than 6 inches or 15 cm) of fine litter from water is possible, but not normal. Litter movement from wind is not expected.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability ratings are typically 2 or 3. Some series on this site have little organic matter in the surface horizon, and the structure is single grain sand. Soil stability will be difficult to measure on these soils. Surface organic matter should still adhere to the soil surface. Surface erosion by water rarely occurs due to rapid infiltration, but surface is susceptible to wind erosion if vegetative cover is reduced due to drought or heavy grazing.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon ranges from 1 to 6 inches (2.5 to 15.25 cm) thick. Dunday soils have an A-horizon ranging from 10 to 19 inches (25.4 to 48.25 cm). Some soils have little organic matter in the A-horizon. Colors are dark grayish brown, grayish brown, pale brown or light brownish gray (values of 4 to 6) when dry and very dark brown, very dark grayish brown, dark brown, or dark grayish brown (values of 2 to 4), when moist. Structure can be single grain to fine granular parting to single grain in the A-horizon.

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, annual brome, and crested wheatgrass may have an adverse impact infiltration and runoff.

    Relative composition is approximately 85 percent grasses or grass-like plants, 10 percent forbs, and 5 percent shrubs. The grass component is composed of C4 tallgrass (30-65%), C3 midgrass (10-20%), C4 midgrass (5-15), C4, short grasses (2-15%), and grass-likes (1-10%).

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 occur 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, C4 tallgrass, 570-1235 #/ac, 30-65% (2 species minimum): prairie sandreed, sand bluestem, big bluestem, switchgrass.

    Phase 1.2
    1. Native, perennial, C4 tallgrass, 210-490 #ac, 15-35% (2 species minimum): prairie sandreed, sand bluestem, big

bluestem, switchgrass.

Phase 1.3
1. Native, perennial, C4, shortgrass, 100-300 #/ac, 10-30%: (1 species minimum): blue grama, hairy grama, threeawn.

Sub-dominant: Phase 1.1
1. Native, perennial, C3 midgrass, 190-380 #/ac, 10-20% (1 species minimum): needle and thread, prairie Junegrass, Indian ricegrass, green needlegrass, Scribner rosettegrass, western wheatgrass.
2. Native, perennial, C4, shortgrass, 35-285 #/ac, 2-15% (2 species minimum): blue grama, hairy grama, sandhill muhly.

Phase 1.2
1. Native perennial, C4, midgrass, 70-210 #/ac, 5-15% (1 species minimum): little bluestem, sand dropseed, sand lovegrass.
2. Native, perennial, C4, shortgrass, 70-210 #/ac, 5-15% (2 species minimum): blue grama, hairy grama, threeawn, sandhill muly, thin paspalum.
3. Native, perennial, C3 midgrass, 70-210 #/ac, 5-15% (1 species minimum): needle and thread, western wheatgrass, Scribner's rosette grass, Indian ricegrass.

Phase 1.3
1. Native, perennial, C3 grass, 100-200 #ac, 10-20% (1 species minimum): needle and thread, western wheatgrass.
2. Shrubs, 30-150 #/ac, 3-15% (1 species minimum): prairie sagewort and other shrubs that vary from location to location.
3. Native, perennial, C4 midgrass, 10-150 #/ac (1 species minimum): 1-15%: sand dropseed.

Other: Minor - Phase 1.1
1. Native, perennial, C4, midgrass, 95-285 #/ac, 0-15% : little bluestem, sand lovegrass, sand dropseed, thin paspalum.
2. Grass-likes, 19-190 #/ac: (1-10%): sedges.
3. Native forbs, 38-190 #/ac (2-10%): Species will vary from location to location.
4. Shrubs and vines, 19-95 #/ac (1-5%): Species will vary from location to location.

Minor - Phase 1.2
1. Native forbs, 28-140 #/ac, 2-10%: species vary from location to location.
2. Shrubs and vines, 28-140 #/ac, 2-10%: Species will vary from location to location.
3. Grass-likes, 14-140 #/ac, 1-10%: sedges.

Minor Phase 1.3
1. Grass-likes, 50-100 #/ac, 5-10%: sedge.
2. Native forbs: species present vary from location to location.
3. Native, perennial, C4, tallgrass, 10-100 #/ac, 1-10%: prairie sandreed.
4. Non-native C3 grass, 0-50 #/ac, 0-5%: cheatgrass, field brome, crested wheatgrass.

Additional: The Reference Community (1.1) or Bluestem-Prairie Sandreed-Needlegrass Community consists of seven F/S groups. These groups, in order of relative abundance, are native, perennial, C4, rhizomatous, tallgrass; native, perennial, C3 midgrass; native, perennial, C4 midgrass; native, perennial, C4 shortgrass; native forbs; grass-likes; and shrubs.

The Prairie Sandreed-Needle and Thread Community (1.2) consists of seven F/S groups. These groups in order of relative abundance are native, perennial, C4 tallgrass, native, perennial, C4 midgrass = native, perennial, C4 shortgrass = native, perennial, C3 midgrass; native forbs = shrubs = grass-likes.

The Needle and Thread-Blue Grama-Sand Dropseed Community consists of eight F/S groups. These groups are native, perennial, C4 shortgrass; native, perennial, C3 grass; shrubs; native, perennial, C4 midgrass; grass-likes; native forbs; native, perennial, C4 tallgrass, and non-native, C3 grass.

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 40 to 60 percent and at a depth of 0.25 to 0.50 inch (0.65 to 1.3 cm). Kentucky bluegrass excessive litter can negatively impact the functionality of this site.

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 1,900 pounds per acre on an air dry weight basis. Low and High production years should yield 1,500 and 2,500 pounds 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, Kentucky bluegrass, crested wheatgrass, absinth wormwood, and eastern red cedar 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.

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.