USDA Natural Resources
Conservation Service

Ecological site R071XY055NE
Sands

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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 may occur on slopes exceeding 10 percent. Where they do occur, they are rare (less than 2 per 100 ft2 or 9.3 m2), narrow (less than 6 inches wide), short (less than 1 foot or 0.3 m long), and disconnected, disrupted by perennial vegetation.

3. **Number and height of erosional pedestals or terracettes:** Bunch grasses may be slightly pedestalled (less than 0.5 inch or 1.3 cm) with no exposed roots; occurrence of pedestalled plants will average less than one per square meter. This typically will occur on south and west aspects where slopes exceed 10 percent. 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 ranges from 5 to 10 percent. Bare ground should be small (less than 6 inches or 15 cm in diameter), are not connected, unless associated with disturbances such as those from burrowing animals. Multi-year drought may increase the amount of bare ground to 15 to 20 percent and bare ground may be increased by 10 percent during the two years following wildfire. 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.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Typically, none. Occasional areas associated with concentrated animal activity (livestock trailing and burrowing animals) may exhibit small wind scoured areas with accompanying deposition. These areas are typically less than 10 feet (3 meters) across and comprise less than 1 percent of the site.

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7. **Amount of litter movement (describe size and distance expected to travel):** None. 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):** This site has low organic matter in the surface horizon and the structure is single grain sand. Soil stability will be difficult to measure on these soils. Soil stability ratings of 2 to 3 are expected. Surface erosion by water rarely occurs due to rapid infiltration, but the surface is susceptible to wind erosion when vegetative cover is reduced due to multi-year drought, wildfire, or multi-year heavy grazing.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface layer is 2 to 9 inches (5 to 23 cm) thick. Soils are predominantly loamy fine sand, fine sand, and sand. The surface layer is dark brown when moist (10 YR 3/3). Color of A1-horizon (0 4 cm) is light brownish gray (10 YR 6/2) and dark brown (10 YR 3/3) when moist. The soil structure is weak coarse granular. Organic matter is 0.5 to 1 percent.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community composition of 75 to 85 percent perennial grasses and grass-likes, 5 to 10 percent forbs, and 5 to 10 percent shrubs will optimize infiltration on the site. The grass and grass-like component is made up of native, perennial, warm-season, mid-grasses (20-30%), native, perennial, warm-season, tall, rhizomatous grasses (35-50%), native, perennial, cool-season grasses (5-10%), native, perennial, warm-season, short grasses (5-10%), and grass-likes (1-5%).

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

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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. No compaction layers occur naturally on this site.

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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, warm-season tallgrass, 945-1350 #/ac- 35-50%, (4 species min.): sand bluestem, Indiangrass, switchgrass, prairie sandreed.

    Phase 1.2
    1. Native, perennial, warm-season, midgrass (2 species min.): little bluestem, sand dropseed, sand lovegrass.

2. Native, perennial, cool-season grass: (3 species minimum): western wheatgrass, needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.

Phase 1.3
1. Native, perennial, cool-season grass: (3 species minimum): western wheatgrass, needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.

2. Native, perennial, warm-season shortgrass (2 species minimum): blue grama, hairy grama, sandhill muhly.

Sub-dominant: Phase 1.1
1. Native, perennial, warm-season, midgrass, 540-810 #/ac- 20-30%, (2 species min.): little bluestem, sand dropseed, sand lovegrass.

2. Native, perennial, cool-season grass, 270-540 #/ac, 10-20% (5 species minimum): western wheatgrass, needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.

Phase 1.2
1. Native, perennial, warm-season, tallgrass (2 species min.): sand bluestem, Indiangrass, switchgrass, prairie sandreed.

2. Native, perennial, warm-season shortgrass (2 species minimum): blue grama, hairy grama, sandhill muhly.

Phase 1.3
1. Native, perennial, warm-season midgrass (2 species min.): little bluestem, sand dropseed, sand lovegrass.

2. Native, perennial, warm-season tallgrass (1 species min.): sand bluestem, switchgrass, prairie sandreed.

Other: Minor - Phase 1.1
1. Forb (perennial and annual),135-270 #/ac, 5-10%: species present will vary from location to location.

2. Native, perennial, warm-season shortgrass, 135-270 #/ac, 5-10%: blue grama, hairy grama, sandhill muhly.

3. Shrub, 27-135 #/ac, 1-5%: leadplant, pricklypear, western sandcherry, rose.

4. Grass-like, 27-81 #/ac, 1-3%: sedges.

Minor - Phase 1.2
1. Forb (perennial and annual): species present will vary from location to location.

2. Shrub: leadplant, pricklypear, western sandcherry, rose.

3. Grass-like: sedges.

Minor - Phase 1.3
1. Shrub: leadplant, pricklypear, western sandcherry, rose.

2. Forb (perennial and annual): species present will vary from location to location;.

3. Grass-like: sedges.

4. Non-native grasses.

Additional: The Reference Community (1.1) includes seven 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 forb (perennial and annual); native, perennial, warm-season shortgrass; shrub; and grass-like.

The Degraded Native Grass Community (1.2) also includes seven F/S Groups. These groups are in order of abundance are native, perennial, warm-season midgrasses; native, perennial cool-season grasses; native, perennial, warm-season tallgrasses; native, perennial, warm-season shortgrasses; and grass-likes.

The At-Risk Native Grass Community includes 8 F/S groups. These groups in order of abundance are native, perennial, cool-season grass; native, perennial, warm-season shortgrass; native, perennial, warm-season midgrass; native, perennial, warm-season tallgrass; shrubs; forbs; grass-likes; non-native grass.

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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 80 to 90 percent and at a depth of 0.25 inches (0.63 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):** Production is shown in air-dry values. The Representative Value (RV) = 2,700 pounds per acre. Low production years = 2,200 pounds per acre. High production years = 3,200 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, eastern redcedar, honey locust, musk thistle, common mullein, and sulphur cinquefoil 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. 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.
