USDA Natural Resources
Conservation Service

Ecological site R065XY012NE
Sands 14-17" PZ

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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:** Typically, none. Bunch grasses may be slightly pedestalled (0.5 inch/1.25 cm) with no exposed roots; occurrence of pedestalled plants will be rare. Pedestals will typically 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 pedestalled plants.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is typically 15 percent or less. Bare ground patches are not connected and are less than 6 inches (15 cm) across, unless associated with disturbance such as burrowing animals. Multi-year drought can increase bare ground to 25 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:** Typically, none. Occasional areas associated with concentrated animal activity (livestock trailing and burrowing animals) may exhibit 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):** Litter should fall in place. Fine litter movement should be less than 6 inches (15 cm). Coarse litter is not expected to move.

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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 less than 2 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 Biological crusts may be present and may serve to provide resistance to erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A-horizon is less than seven inches thick and is typically 2 to 4 inches (5-10 cm) thick.. Soils have little organic matter in the A-horizon and soil color is grayish brown (values of 4 to 6) when dry and dark grayish brown colors (values of 3 to 5) when moist. Structure ranges from weak very fine granular to single grained in the A-horizon.

   Valentine is the major soil series correlated to this ecological site.

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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. Woody encroachment may adversely impact infiltration on this site.

    The expected composition of the plant community is 85 to 90 percent grasses and grass-likes, 5 to 10 percent forbs, and 1 to 5 percent shrubs. The perennial grass component consists of warm-season tallgrass (40-60%), warm-season midgrass (5-15%), warm-season shortgrass (5-10%), and cool-season grass (5-15%).

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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. Compaction layers 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, warm-season tallgrass, 760-1140 #/ac, 40-60%, 3 species minimum: sand bluestem, prairie

sandreed, switchgrass, Indiangrass.

Phase 1.2
1. Native, perennial, warm-season tallgrass, 765-1020 #/ac, 45-60%, 2 species minimum: sand bluestem, prairie sandreed.

Phase 1.3
1. Native, perennial, cool-season grass, 280-490 #/ac, 20-35%, 2 species minimum: needle and thread, Indian ricegrass, Scribner's rosette grass, prairie Junegrass.
2. Native, perennial, warm-season tallgrass, 210-350 #/ac, 15-25%, 2 species minimum: sand bluestem, prairie sandreed, switchgrass

Sub-dominant: Phase 1.1
1. Native, perennial, cool-season grass, 95-285 #/ac, 5-15%, 2 species minimum: needle and thread, porcupinegrass, Scribner's rosette grass, prairie Junegrass, Indian ricegrass.
2. Native, perennial, warm-season midgrass, 95-285 #/ac, 5-15%, 1 species minimum: little bluestem, sand lovegrass, sand dropseed, blowout grass.

Phase 1.2
1. Native, perennial, warm-season shortgrass, 85-255 #/ac, 5-15%, 1 species minimum: blue grama, hairy grama, thin paspalum, sandhill muhly.

Other: Minor - Phase 1.1
1. Native, perennial, warm-season shortgrass, 95-190 #/ac, 5-10%: blue grama, hairy grama, thin paspalum, sandhill muhly.
2. Native forb, 95-190 #/ac, 5-10%: forbs present vary from location to location.
3. Grass-like, 19-95 #/ac, 1-5%: sedge
4. Native shrub, 19-95 #/ac, 1-5%: sand sagebrush, prairie sagewort, brittle pricklypear, western sandcherry, rose, soapweed yucca.

Minor - Phase 1.2
1. Native forb, 85-170 #/ac, 5-10%: forbs present vary from location to location.
2. Native, perennial, cool-season grass, 17-170 #/ac, 1-10%: Indian ricegrass, needle and thread, prairie Junegrass.
3. Native, perennial, warm-season midgrass, 0-170 #/ac, 0-10%: sand lovegrass, little bluestem, sand dropseed.
4. Grass-like, 17-85 #/ac, 1-5%: sedges.
5. Shrub, 17-85 #/ac, 1-5%: sand sagebrush, prairie sagewort, brittle prickly-ear, rose, soapweed yucca.

Minor - Phase 1.3
1. Native forb, 70-210 #/ac, 5-15%: forbs present vary from location to location.
2. Native, perennial, warm-season midgrass, 28-140 #/ac, 2-10%: little bluestem, sand dropseed.
3. Native, perennial, warm-season shortgrass, 28-70#/ac, 2-5%: blue grama, hairy grama, thin paspalum, sandhill muhly.
4. Native shrub, 14-70 #/ac, 1-5%: sand sagebrush, prairie sagewort, rose, western sandcherry, soapweed yucca, brittle pricklypear.

Trace - Phase 1.2
1. Non-native Grass, 0-35 #/ac, 0-2%: cheatgrass.

Trace - Phase 1.3
1, Grass-like, 0-28 #/ac, 0-2%: sedge.
2. Non-Native Grass, 0-28 #/ac, 0-2%: cheatgrass.

Additional: The Reference Community (1.1) includes seven F/S groups. These groups are, in order of relative

abundance, native, perennial, C4 tallgrass; native, perennial, C4 midgrass=native, perennial, C3 grass; native, perennial, C4 shortgrass=native forb; grass-like=shrub.

The At-Risk Community (1.2) includes eight F/S groups which are in order of relative abundance native, perennial, C4 tallgrass; native, perennial, C4 shortgrass; native, perennial, C3 grass; native forb; native, perennial C4 midgrass; grass-like=shrub; non-native grass.

The Excessive Litter Community (1.3) includes eight F/S groups which are native, perennial, C3 grass; native, perennial, C4 tallgrass; forb; native, perennial, C4 midgrass; native, perennial, C4 shortgrass; shrub; grass-like=non-native C3 grass.

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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. . The exception is the potential of up to 25 percent mortality of mid and short, warm-season bunch grasses during multi-year drought cycles. 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 45 to 60 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 30 to 50 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 1,900 pounds per acre on an air dry weight basis. Low and high production years should yield 1,600 and 2,500 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 brome are known invasives that have the potential to be dominant or co-dominant on the site. While native, sand sagebrush also has the potential to become invasive and dominate the site. Consult the state noxious weed and state watch lists for potential invasive species.

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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.
