USDA Natural Resources
Conservation Service

Ecological site R065XY029NE
Sandy Lowland

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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 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 typically 5 percent or less.

   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.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Wind-scoured areas and depositional areas are not expected on this site.

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter should fall in place. 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):** Soil stability ratings should typically be 5 to 6, normally 6. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A-horizon should be 4 to 8 inches (10-20.5 cm) thick; some soil series will be up to 12 inches (30 cm) thick. Soil color will be dark grayish brown (values of 3 to 5) and very dark grayish brown (values of 2 to 3) when moist. Soil structure may be single grained, weak very fine granular, weak fine granular, weak coarse subangular blocky parting to weak fine or weak medium granular.

   Ipage is the major soil series correlated to this ecological site. Other soil series that have been correlated to this site include Boel, Calamus, Doughboy, Dunn, Gosper, Libory, Munjor, and Natick.

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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 80 to 90 percent grasses and grass-likes, 5 to 10 percent forbs, and 1 to 10 percent shrubs. The perennial grass and grass-like component is made up of warm-season tallgrass (40-60%), warm-season midgrass (20-30%), cool-season grass (10-20%), warm-season shortgrass (5-10%), and grass-like (1-5%).

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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, 1160-1740 #/ac, 40-60%, 3 species minimum: sand bluestem, prairie sandreed, switchgrass, Indiangrass.
    2. Native, perennial, warm-season midgrass, 580-870 #/ac, 20-30%, 1 species minimum: little bluestem, sand lovegrass, purple lovegrass, sand dropseed

    Phase 1.2
    1. Native, perennial, warm-season tallgrass, 2 species minimum: sand bluestem, prairie sandreed, switchgrass,

Indiangrass.

Sub-dominant: Phase 1.1
1. Native, perennial, cool-season grass, 290-580 #/ac, 10-20%, 1 species minimum: needle and thread, western wheatgrass, prairie Junegrass, Scribner's rosette grass.

Phase 1.2
1. Native, perennial, cool-season grass, 2 species minimum: needle and thread, western wheatgrass, prairie Junegrass, Scribner's rosette grass.
2. Native, perennial, warm-season shortgrass, 1 species minimum: hairy grama, blue grama, thin paspalum.

Other: Minor - Phase 1.1
1. Native, perennial, warm-season shortgrass, 145-290 #/ac, 5-10%: hairy grama, blue grama, thin paspalum.
2. Native perennial and annual forb, 145-290 #/ac, 5-10%: forbs present vary from location to location.
3. Shrub, 29-290 #/ac, 1-10%: leadplant, rose, western sand cherry, and other shrubs that vary from location to location.
4. Grass-like, 29-145 #/ac, 1-5%: sedges.

Minor - Phase 1.2
1. Native, perennial, warm-season midgrass: little bluestem, sand lovegrass, purple lovegrass, sand dropseed.
2. Grass-like: sedge
3. Native perennial and annual forb: forbs present vary from location to location.
4. Shrub: leadplant, rose, western sand cherry, and other shrubs that vary from location to location.

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 perennial and annual forb; shrub; grass-like.

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

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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. 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 75 to 85 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 50 to 60 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 2,900 pounds per acre on an air dry weight basis. Low and high production years should yield 2,400 and 3,400 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), smooth brome, leafy spurge, Kentucky bluegrass, and eastern redcedar 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.

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 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.
