USDA Natural Resources
Conservation Service

Ecological site R066XY031NE
Steep Sandy

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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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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Typically, none. A slight presence of rills may exist on steeper slopes (greater than 30 percent). When they do occur, rills are shallow (less than 6 inches deep) and narrow (less than 3 inches wide). As slopes increase, rills will be more frequent, deeper, and wider.

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2. **Presence of water flow patterns:** Typically, none. Water flow patterns are not expected on slopes of 30 percent or less. They may occur on steeper slopes. Where they do occur, they are rare, narrow (less than 6 inches wide), short (less than 12 inches long) and disconnected, disrupted by perennial vegetation.

3. **Number and height of erosional pedestals or terracettes:** Typically, none. Occasionally, bunch grasses may be slightly pedestalled (0.5 inch/1.25 cm) with no exposed roots. Multi-year 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 12 inches (30 cm) across, unless associated with disturbance such as burrowing animals. Multi-year drought and/or wildfire can increase bare ground to 25 percent for up to two years following the disturbance. Cross-sectional viewing of this site appears to have more bare ground than vertical viewing due to exposed steep slopes. Nearly vertical slopes should not be included in the evaluation as those areas are not part of the steep sandy site but are considered a non-site.

   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 curst (e.g., lichen, mosses, algae).

5. **Number of gullies and erosion associated with gullies:** Gullies may be present, typically in association with drainageways and on steeper slopes. Gullies may develop after intense rainfall events and will re-vegetate rapidly.

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.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter movement of 1 to 3 feet (0.3 to 1 meter) is possible during intense rains. Coarse litter may move but will move shorter distances than fine litter.

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 4 to 6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 2 to 9 inches (5 to 23 cm) thick. Soil colors are dark gray, grayish brown, or dark grayish brown (values of 4 or 5) when dry and very dark grayish brown, very dark gray or dark grayish brown (values of 3 or 4) when moist. Structure is typically weak fine granular to weak very fine granular.

   The primary soil series correlated to the Steep Sandy ecological site are McKelvie, Peji, and Blula.

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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. The presence of trees in excess of that in the Reference State (1) may adversely impact infiltration.

    The expected composition of the plant community is 75 to 90 percent perennial grasses and grass-likes, 5 to 10 percent forbs, 0 to 5 percent shrubs, and 5 to 10 percent coniferous trees. The perennial grass and grass-like component is made up of C4, tallgrasses; C4, midgrasses; C4, shortgrasses; C3, bunchgrasses; and grass-likes.

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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. A compaction layer 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, C4, tallgrass, (2 species minimum): prairie sandreed, sand bluestem, switchgrass.
    2. Native, perennial, C4, midgrass, (2 species minimum): little bluestem, sideoats grama, sand dropseed

Phase 1.2
1. Native, perennial, C4, midgrass, (2 species minimum): little bluestem, sideoats grama, sand dropseed.
2. Native, perennial, C3, bunchgrasses (3 species minimum): needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.

Phase 1.3
1. Native, perennial, C4 shortgrass (1 species minimum): blue grama, hairy grama.
2. Native, perennial, C4, midgrass, (2 species minimum): little bluestem, sideoats grama, sand dropseed.

Sub-dominant: Phase 1.1
1. Native, perennial, C3, bunchgrasses (3 species minimum): needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.
2. Native, perennial, C4 shortgrass (1 species minimum): blue grama, hairy grama.

Phase 1.2
1. Native, perennial, C4, tallgrass, (2 species minimum): prairie sandreed, sand bluestem, switchgrass
2. Native, perennial, C4 shortgrass (1 species minimum): blue grama, hairy grama.

Phase 1.3
1. Native, perennial, C3, bunchgrasses (3 species minimum): needle and thread, porcupinegrass, prairie Junegrass, Scribner's rosettegrass.
3. Grass-like (1 species minimum): threadleaf sedge, other sedges.

Other: Minor - Phase 1.1
1. Native forb: forbs vary from location to location.
2. Grass-likes: sedges.
3. Coniferous trees: ponderosa pine.
4. Shrubs: shrubs vary from location to location.

Minor - Phase 1.2
1. Grass-like: sedges.
2. Forbs: forbs present vary from location to location.
3. Coniferous trees: ponderosa pine.
4. Shrubs: shrubs vary from location to location

Minor - Phase 1.3
1. Coniferous trees: ponderosa pine.

2. Shrubs: shrubs present vary from location to location.
3. Forbs: forbs present vary from location to location.
4. Non-native C3 grass: Kentucky bluegrass, field brome, smooth brome, cheatgrass.
5. Native, perennial, C4, tallgrass, (2 species minimum): prairie sandreed, sand bluestem, switchgrass.

Additional: The Reference Community (1.1) consists of eight F/S groups. These groups are, in order of relative abundance, native, perennial, C4 tallgrass; native, perennial, C4 midgrass; native, perennial, C3 bunchgrass; perennial, C4 shortgrass; native forb = grass-like = coniferous tree; shrub.
The Degraded Native Community (1.2) consists of eight F/S groups. These groups in order of relative abundance are native, perennial, C4 midgrass; native, perennial, C3 bunchgrass = perennial, C4 shortgrass; native, perennial, C4 tallgrass; native forb = grass-like = coniferous tree; shrub.

The At Risk Community (1.3) also consists of nine groups which are native, perennial, C4, shortgrass = native, perennial, C4 midgrass; native, perennial, C3 bunchgrass; grass-like; coniferous tree; forb = shrub = non-native C3 grass; native, perennial, C4 tallgrass.

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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 50 to 80 percent and at a depth of 0.25 to 0.50 inch (0.65 to 1.3 cm). Litter cover during and following multi-year drought can range from 30 to 40 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 2,200 pounds per acre on an air dry weight basis. Low and High production years should yield 1,800 and 2,600 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), eastern redcedar, and Kentucky bluegrass 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.

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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.
