USDA Natural Resources
Conservation Service

Ecological site GX064X01X028
Loamy Terrace

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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.

Author(s)/participant(s)	Stan Boltz, Mitch Faulkner, Emily Helms, John Hartung, Ryan Murray, George Gamblin, Rick Peterson, Nadine Bishop, Jeff Nichols
Contact for lead author	jeffrey.nichols@usda.gov
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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 should not be present.

2. **Presence of water flow patterns:** Typically, none. If present, water flow patterns will be barely visible and discontinuous.

3. **Number and height of erosional pedestals or terracettes:** None. Pedestals or terracettes should not be present.

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 or less.

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:** None. Wind scoured areas and depositional areas should not be present.

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.

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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):** A-horizon should be 3 to 25 inches (12.5 to 38 cm) thick. Colors range from dark gray, grayish brown, grayish brown, light brownish gray, to pale brown (values of 4 to 6) when dry and from black, dark brown, very dark grayish brown to dark grayish brown (values of 2 to 4) when moist. Structure typically is medium to fine granular in the upper A-horizon. Soils may be stratified and the site experiences rare flooding and accompanying deposition.

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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 80 percent grasses and grass-like plants, 10 percent forbs, and 10 percent shrubs and trees. The grass/grass-like component is composed of C3, rhizomatous grasses (25-40%), C3, bunch grasses (10-30%), C4, tall, rhizomatous grasses (5-25%), C4, short grasses (5-10%), C4 mid-grasses (5-10%), and grass-likes (5-10%).

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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. When dry, B-horizons can be hard and appear to be compacted. Bigbend soils will have a natural platy structure near the surface.

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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, C3, rhizomatous grass, 650-1040 #/ac, 25-40% (1 species minimum): western wheatgrass, thickspike wheatgrass.
    2. Native, perennial, C3, bunchgrass, 260-650 #/ac, 10-30% (3 species minimum): green needlegrass, needle and thread, prairie Junegrass, Sandberg bluegrass.
    3. Native, perennial, C4, tallgrass, 130-650, 5-25% (2 species minimum): big bluestem, prairie sandreed, switchgrass.

    Phase 1.2
    1. Native, perennial, C4, shortgrass, 320-640 #/ac, 20-40% (2 species minimum): blue grama, buffalograss, saltgrass, threeawn.
    2. Native, perennial, C3, rhizomatous grass, 160-400 #/ac, 10-25% (1 species minimum): western wheatgrass, thickspike wheatgrass.

Sub-dominant: Phase 1.1
1. Native forbs, 208-390 #/ac, 5-15% (7 species): white sagebrush, white heath aster, purple prairie clover, silverleaf Indian breadroot, American licorice, American vetch, western yarrow and other forbs which vary from location to location.
2. Shrubs, 130-390 #/ac, 5-15% (6 species minimum): silver sagebrush, western snowberry, American plum, chokecherry, prairie sagewort, rose and other shrubs which vary from location to location.

Phase 1.2
1. Native, perennial, C4, midgrass, 80-320 #/ac, 5-20% (3 species minimum): sand dropseed, sideoats grama, composite dropseed, sand dropseed.
2. Grass-likes, 80-240 #/ac, 5-15% (1 species minimum): sedges, other grass-likes.
3. Native forbs, 80-240 #/ac, 5-15% (14 species minimum): white heath aster, rush skeletonplant, goatsbeard, white sagebrush, silverleaf Indian breadroot, vervain, cuman ragweed, pussytoes, scarlet globemallow, western yarrow, field sagewort, upright prairie coneflower, Canadian horseweed, and other forbs which vary from location to location.

Other: Minor - Phase 1.1
1. Native, perennial, C4, midgrass, 130-390 #/ac, 5-15% (2 species minimum): sideoats grama, composite dropseed.
2. Native, perennial, C4, shortgrass, 130-290 #/ac, 5-10%: blue grama, buffalograss, saltgrass, threeawn.
3. Grass-likes, 130-260 #/ac, 5-10%: threadleaf sedge, other sedges.
4. Native trees, 26-130 #/ac, 1-5%: trees present will vary from location to location.

Minor - Phase 1.2
1. Shrubs, 80-160 #/ac, 5-10%: shrubs present will vary from location to location.
2. Native, perennial, C3 bunchgrass, 48-160#/ac, 3-10%: green needlegrass, needle and thread, prairie Junegrass, Sandberg bluegrass.
3. Non-native grass, 16-160 #/ac, 1-10%: Kentucky bluegrass, smooth bromegrass, cheatgrass.
4. Native, perennial, C4 tallgrass, 32-80, 2-5%: big bluestem, Indiangrass, switchgrass.
5. Native trees, 0-80 #/ac, 0-5%: trees present will vary from location to location.

Additional: The Rhizomatous Wheatgrass-Needle and Thread-Big Bluestem/Shrubs/Scattered Trees Community or Reference Community (1.1) consists of nine F/S groups. These groups, in order of relative abundance are native, perennial, C3, rhizomatous grass; native, perennial, C3, bunchgrass; native, perennial, C4 tallgrass; native forbs; shrubs; native, perennial, C4 shortgrass = native, perennial, C4 midgrass = grass-likes; and native trees.

The Blue Grama-Rhizomatous Wheatgrass /Shrubs / Scattered Trees Community (1.2) includes ten F/S groups. These groups in order of relative abundance are native, perennial, C4, shortgrass; native, perennial, C3, rhizomatous grass; native, perennial, C4 midgrass; grass-likes = native forbs; shrubs; native, perennial, C3, bunchgrass; non-native grass; native, perennial, C4 tallgrass; and native trees.

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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 (0.65-1.3 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):** Annual production is 2,600 pounds per acre on an air-dry weight basis in a year with normal precipitation

and temperatures. Low and High production years should yield 1,700 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, Kentucky bluegrass, crested wheatgrass, common mullein, 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.

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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.
