

Ecological site R066XY040NE

Shallow Limy

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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:** Slight presence of water flow patterns on slopes exceeding 15 percent. When present they are rare, slightly visible, less than 0.5 inches (1.25 cm) deep, less than 6 inches (15.25 cm) wide, and less than 1 foot (30.5 cm) long. When present they are disconnected and disrupted by perennial vegetation.
3. **Number and height of erosional pedestals or terracettes:** Typically, none. Pedestals and/or terracettes are not expected to occur on this site. Occasionally, bunch grasses may be pedestalled on slopes greater than 15 percent, with no exposed roots. Drought, wildfire, and prescribed burns should not increase the incidence of pedestals except on the steepest slopes.
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 and patch sizes will be less than 3 inches (7.6 cm). Multi-year drought and/or wildfire can increase bare ground to 20-30 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), 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.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Wind-scoured and/or depositional areas should not be present.

7. **Amount of litter movement (describe size and distance expected to travel):** On gently sloping sites (less than 15 percent) litter movement is not expected. As slopes become steeper, small size litter classes will generally move short distances usually less than 12 inches (30 cm). Medium size class litter will move very short distances usually less than 6 inches (15 cm). Coarse litter is not expected to move. Litter debris dams are occasionally present.

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.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A-horizon is typically 4 to 12 inches (10 to 31 cm) thick, but some soils are more shallow. Soil colors are dark gray, dark grayish brown, brown or light brownish gray, or grayish brown (values 4 to 6) when dry and very dark gray, very dark grayish brown, dark grayish brown, or dark brown (values 3 to 5) when moist. Structure is weak medium granular, weak fine granular, moderate fine granular.

See Official Soils Descriptions for additional details; major soil series correlated to the site are Longpine, Tassel, Mariaville, Canyon, Epping, Shena, and Fishberry.

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 negatively influence infiltration. Under some management regimes, shortgrass and threadleaf sedge sod may develop which will also negatively influence infiltration.

The expected composition of the plant community is 80 to 90 percent perennial grasses and grass-likes, 5 to 10 percent forbs, and 5 to 10 percent shrubs. The perennial grass and grass-like component is made up of C4, rhizomatous, tallgrasses (15-25%); C4, midgrasses (15-30%), C3, bunchgrasses (10-25%), C4, shortgrasses (5-15%), C3, rhizomatous grasses (2-10%); and grass-likes (2-8%).

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 are expected for this site.

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 midgrass, 255-510 #/ac, 15-30% (3 species minimum): little bluestem, sideoats grama, plains muhly, purple lovegrass, sand dropseed.
2. Native, perennial, C4 tallgrass, 255-425 #/ac, 15-25% (3 species minimum): big bluestem, sand bluestem, prairie sandreed, switchgrass, Indiangrass.
3. Native, perennial, C3 bunchgrass, 170-425 #/ac, 10-25% (4 species minimum): needle and thread, porcupinegrass, green needlegrass, Canada wildrye, prairie Junegrass, Scribner's rosette grass, fall rosette grass.

Phase 1.2

1. Native, perennial, C4 midgrass, 280-490 #/ac, 20-35% (4 species minimum): little bluestem, sideoats grama, plains muhly, purple lovegrass, sand dropseed.
2. Native, perennial, C3 bunchgrass, 140-350 #/ac, 10-25% (3 species minimum): needle and thread, porcupinegrass, green needlegrass, Canada wildrye, prairie Junegrass, Scribner's rosette grass, fall rosette grass.

Sub-dominant: Phase 1.1

1. Native, perennial, C4 shortgrass, 85-255 #/ac, 5-15% (1 species minimum): blue grama, buffalograss, hairy grama, threeawn.

Phase 1.2

1. Native, perennial, C4 shortgrass, 70-280 #/ac, 5-20% (1 species minimum): blue grama, buffalograss, hairy grama, threeawn.

Other: Minor - Phase 1.1

1. Native forb, 85-170 #/ac, 5-10%: forbs vary from location to location .
2. Shrub, 85-170 #/ac, 5-10%: leadplant, prairie sagewort, rose, smooth sumac.
3. Native, perennial, C3, rhizomatous grass, 34-170 #/ac, 2-10%: western wheatgrass.

Minor - Phase 1.2

1. Forbs, 70-140 #/ac, 5-10%: forbs vary from location to location.
2. Grass-likes, 28-140 #/ac, 2-10%, (1 species minimum): threadleaf sedge, sedges.
3. Native, perennial, C4 tallgrass, 28-112 #/ac, 2-8%: big bluestem, sand bluestem, prairie sandreed, switchgrass, Indiangrass.
4. Native, perennial, C3, rhizomatous grass, 28-112 #/ac, 2-8%: western wheatgrass.
5. Shrubs, 70-140 #/ac, 5-10%: prairie sagewort, plains pricklypear, rose and other shrubs that vary from location to location.
6. Non-Native, C3 grass, 28-70 #/ac, 2-5%: Kentucky bluegrass, cheatgrass, smooth brome.

Trace - Phase 1.1

1. Native trees, 0-34 #/ac, 0-2%: ponderosa pine, eastern redcedar, other trees.
2. Grass-likes, 0-34 #/ac, 0-2%: threadleaf sedge, other sedges.

Trace - Phase 1.2

1. Native trees, 0-28 #/ac, 0-2%: ponderosa pine, eastern redcedar, other trees.

Additional: The Reference Community (1.1) consists of nine F/S groups. These groups are in order of relative abundance native, perennial, C4 midgrass; native, perennial, C4 tallgrass; native, perennial C3 bunchgrass; native, perennial, C4 shortgrass; forbs; shrub; native, perennial, C3 rhizomatous grass; shrubs, grass-likes and trees.

The At-Risk Community (1.2) consists of ten F/S groups. These groups are, in order of relative abundance, native, perennial, C4 midgrass; native, perennial, C3 bunchgrass; native, perennial, C4 shortgrass; forb; grass-like; shrub = native, perennial, C4 tallgrass = native, perennial, C3 rhizomatous grass; non-native, C3 grass; native tree.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Bunchgrasses 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 70 percent and at a depth of approximately 0.25 inch (0.65 cm).
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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 1,700 pounds per acre in a year with normal precipitation and temperatures. Low and High production years should yield 1,000 and 2,300 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), common mullein, and eastern redcedar are known invasives that have the potential to become dominant or co-dominant on the site.

Note: species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

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.
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