

Ecological site R067AY176WY
Very Shallow (VS)

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

Indicators

1. **Number and extent of rills:** None. Rills are not expected on the site.
2. **Presence of water flow patterns:** None expected on more level terrain. Water flow patterns will be present on steeper slopes (greater than 30 percent) becoming more abundant as slopes increase. Debris dams will be present in association with the waterflow patterns.
3. **Number and height of erosional pedestals or terracettes:** None expected on more level terrain. Pedestalled plants and terracettes may be present on steeper slopes (greater than 30 percent) becoming more common as slopes increase. Debris dams will be present in association with the waterflow patterns.
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 20 to 40 percent occurring in patches up to 12 to 24 inches (30.5- 61 cm) in diameter.
5. **Number of gullies and erosion associated with gullies:** None. Gullies should not be present on this site.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Small size litter classes will generally move short distances (less than 6 inches/15.25 cm), some medium size class litter will move very short distances. Litter debris dams are present. On the steepest slopes (greater than 30 percent), litter will travel greater distances.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil aggregate stability ratings should typically be 3 or greater. Surface organic matter adheres to the soil surface. Soil surface peds will typically retain structure for 1 minute or longer when dipped in distilled water.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface layer ranges from 2 to 6 inches (5.1-15.25 cm) thick. Soil colors range from yellowish brown, light grayish brown, to brown (values of 5 to 6) when dry and light yellowish brown, dark grayish brown, or dark brown (values of 3 to 4) when moist. Soil surface structure is fine to medium granular.

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 expected composition of the plant community is 70 to 90 percent perennial grasses and grass-likes, 5 to 15 percent forbs, and 5 to 15 percent shrubs and trees.

The grass and grass-like component is made up of cool-season, bunch grasses (10-50%); cool-season, rhizomatous grasses (10-15%), warm-season short grasses (5-10%); warm-season mid-grasses (15-30%); and grass-likes (5-10%)

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.

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: 12-14" PZ - Community 1.1:

1. Native, C3, bunch grasses – 55-275 #/ac (10-50%), 2 species minimum

15-17" PZ - Community 1.1:

Native, C3 bunch grasses – 60-300 #/ac (10-50%), 2 species minimum

Sub-dominant: 12-14" PZ - Community 1.1:

2. Native, C4, mid-grasses – 83-165 #/ac (15-30%), 2 species minimum

3. Native, C3, rhizomatous grasses – 55-83 #/ac (10-15%), 1 species minimum

4. Native, Perennial and Annual Forbs – 55-83 #/ac (10-15%), 5 species minimum

5. Shrubs, Vines, Cacti – 28-83 #/ac (5-15%), 1 species minimum

15-17" PZ - Community 1.1:

2. Native, C4, mid-grasses – 90-180 #/ac (15-30%), 2 species minimum
3. Native, C3, rhizomatous grasses – 60-90 #/ac (10-15%), 1 species minimum
4. Native, Perennial and Annual Forbs – 60-90 #/ac (10-15%), 5 species minimum

Other: Minor:

12-14" PZ - Community 1.1:

6. Native, C4, short grasses – 28-55 #/ac (5-10%)
7. Grass-likes – 28-55 #/ac (5-10%)
8. Trees – 0-28 #/ac (0-5%)

15-17" PZ - Community 1.1:

5. Native, C4, short grasses – 30-60 #/ac (5-10%)
6. Grass-likes – 30-60 #/ac (5-10%)
7. Shrubs, Vines, Cacti – 0-30 #/ac: (0-5%)
8. Trees – 0-30 #/ac (0-5%)

Additional: 12-14" PZ - Community 1.1:

12a. Relative Dominance: Native, C3 bunch grasses > Native, C4, mid-grasses > Native, C3, rhizomatous grasses = Native, Annual or Perennial Forbs > or = Shrubs, Cacti, Vines > C4, short grasses = Grass-likes > Trees

12b. F/S Groups not expected for the site: Introduced annual grasses, perennial introduced and naturalized grasses.

12c. Number of F/S Groups: 8

12d. Species number in Dominant and Sub-dominant F/S Groups: 11

15-17" PZ - Community 1.1:

12a. Relative Dominance: Native, C3 bunch grasses > Native, C4, mid-grasses > Native, C3, rhizomatous = Native, Annual or Perennial Forbs > Native, C4, short grasses = Grass-likes > Shrubs, Cacti, Vines = Trees

12b. F/S Groups not expected for the site: Introduced annual grasses, perennial introduced and naturalized grasses.

12c. Number of F/S Groups: 8

12d. Species number in Dominant and Sub-dominant F/S Groups: 10

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little evidence of decadence or mortality. Bunch grasses have strong, healthy centers with less than 3 percent mortality and shrubs have few dead stems. The exception is the potential of up to 20 percent mortality in mid and short, warm-season bunch grasses during multi-year drought cycles.
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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 30 to 50 percent. Litter depth is expected to be 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):** In the 12-14" precipitation zone, annual production ranges from 450 to 650 pounds per acres (air dry basis). Average annual production is 550 pounds per acre under normal precipitation and weather conditions.

In the 15-17" Precipitation Zone, annual production ranges from 475 to 725 pounds per acre (air dry basis). Average annual production is 600 pounds per acre under normal precipitation and weather conditions.

No significant reduction is expected the growing season following wildfire.

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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: Annual bromes, Russian thistle, kochia, broom snakeweed, fringed sagewort, pricklypear, and others as they become known.

See:

Colorado Department of Agriculture Invasive Species Website:

<https://www.colorado.gov/pacific/agconservation/noxious-weed-species>

Wyoming Weed and Pest Council Website: <https://wyoweed.org/>

Nebraska Invasive Species website: <https://neinvasives.com/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.
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