

## Ecological site R067AY150WY Sandy (Sy)

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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:** None. Rills are not expected on the site.  

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- 2. Presence of water flow patterns:** Typically, none. Water flow patterns, if present, are associated with animal activity on slopes greater than 6 percent and will be very short, narrow, and disconnected.  

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- 3. Number and height of erosional pedestals or terracettes:** Typically, None.  

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- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is typically is 5 to 10 percent and scattered in patches less than 3 inches (7.62 cm) wide.  

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- 5. Number of gullies and erosion associated with gullies:** None. Gullies should not be present on this site.  

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- 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. Slight amount of movement 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 aggregate stability ratings should typically be 5 to 6, normally 6. Surface organic matter adheres to the soil surface. Soil surface peds will typically retain structure indefinitely when dipped in distilled water.

Surface erosion by water rarely occurs due to rapid infiltration, but surface is susceptible to wind erosion when vegetative cover is reduced due to multi-year drought, wildfire, or multi-year heavy grazing.

Biological crusts may be present (up to 10 percent of the surface) and serve to provide resistance to erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface layer should be 5 to 12 inches (12.7-30.5 cm) thick. Soil colors vary with soil series from dark grayish brown, grayish brown, to brown (values of 4 to 5) when dry and dark grayish or very dark grayish brown (values of 3 to 4) when moist. Vonalee and Keeline soils are yellowish brown (5/4) dry and brown (4/3) moist. Structure typically is fine to medium granular.

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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 expected composition of the plant community is 70 to 95 percent perennial grasses and grass-likes, 5 to 15 percent forbs, and 0 to 15 percent shrubs.

In the 12-14" PZ, the perennial grass and grass-like component is made up of tall, warm-season, rhizomatous grasses (10-35%); cool-season bunch grasses (15-40%); mid, warm season grasses (5-25%), short, warm-season grasses (5-15%); cool-season rhizomatous grasses (5-10%); and grass-likes (0-10%).

In the 15-17" PZ, the perennial grass and grass-like component is made up of tall, warm-season, rhizomatous grasses (15-40%); cool-season bunch grasses (10-40%); mid, warm season grasses (5-25%), short, warm-season grasses (5-15%); cool-season rhizomatous grasses (5-10%); and grass-likes (0-10%).

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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. 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: 12-14" PZ: Community 1.1:

1. Native, C3, bunch grasses– 195-520 #/ac (15-40%), 1 species minimum
2. Native, C4, tall, rhizomatous grasses – 130-455 #/ac (10-35%), 1 species minimum

15-17" PZ: Community 1.1:

1. Native, C3, bunch grasses– 225-600 #/ac (15-40%), 1 species minimum

2. Native, C4, tall, rhizomatous grasses – 150-600 #/ac (10-40%), 1 species minimum

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

3. Native, C4, mid-grasses – 65-325 #/ac (5-25%), 1 species minimum

4. Native, C4, short grasses – 65-195 #/ac (5-15%), 1 species minimum

5. Shrubs, cacti, vines – 13-195#/ac (1-15%), 1 species minimum

6. Native, Perennial and Annual Forbs – 65-195 #/ac (5-15%), 5 species minimum

15-17" PZ: Community 1.1:

3. Native, C4, mid-grasses – 75-375 #/ac (5-15%), 1 species minimum

4. Native, C4, short grasses – 75-225 #/ac (5-15%), 1 species minimum

5. Shrubs, cacti, vines – 15-225 #/ac (1-15%), 1 species minimum

6. Native, Perennial and Annual Forbs – 75-225 #/ac (5-15%), 5 species minimum

Other: Minor:

12-14" PZ: Community 1.1:

7. Native, C3, rhizomatous grasses – 65-130 #/ac (5-10%)

8. Grass-likes – 0-130 #/ac: (0-10%)

15-17" PZ: Community 1.1:

7. Native, C3, rhizomatous grasses – 75-150 #/ac (5-10%)

8. Grass-likes – 0-150 #/ac: (0-10%)

Additional: 12-14" PZ: Community 1.1:

12a. Relative Dominance:

Native, C3, bunch grasses = Native, C4, tall and mid grasses > Native, C4, Mid-grasses > C4, short grasses = Native, Perennial and Annual Forbs > or = Shrubs, cacti, vine > Native, C3, Rhizomatous Grasses > Grass-likes

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

12c. Number of F/S Groups: 8

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

15-17" PZ: Community 1.1:

12a. Relative Dominance:

Native, C3, bunch grasses = Native, C4, tall grasses > Native, C4, Mid-grasses = C4, short grasses = Native, Perennial and Annual Forbs > or = Shrubs, cacti, vine > Native, C3, Rhizomatous Grasses > Grass-likes

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

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 10 percent mortality in the 15-17" PZ and up to 15 percent mortality in the 12-14" PZ of 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 50 to 70 percent. Litter depth is expected to be 0.25-0.50 inch (0.65-1.3 cm). Litter cover during and following drought can range from 40 to 50 percent and 5 to 15 percent following wildfire.
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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 750 to 1750 pounds per acres (air dry basis) Average annual production is 1,300 pounds per acre under normal precipitation and weather conditions.

In the 15-17" Precipitation Zone, annual production ranges from 1000 to 2000 pounds per acre (air dry basis). Average annual production is 1,500 pounds per acre under normal precipitation and weather conditions.

No significant reduction is expected in 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, common mullein, crested wheatgrass, fringed sagewort, hairy gold aster, 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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