

Ecological site R034BY205UT Semidesert Gravelly Loam (Wyoming Big Sagebrush)

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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

- Number and extent of rills:** None. Some very minor rill development may be evident following significant thunderstorm or snow melt events but should mostly heal during the following growing season. The presence of rills may also be apparent where run-on from adjacent upland sites or exposed bedrock concentrate flows. Any rill development present should be less than 1 inch deep, moderately short (< 6') and spaced a minimum of 10 to 12 feet apart.
- Presence of water flow patterns:** A very few stable overland flow patterns may be present and wind around plant bases. They should show no evidence of current erosion or deposition. Flow patterns present are normally 15 to 20 feet long, follow natural contours, and are typically spaced at least 10 to 15 feet apart. A slight increase in flow activity may be observed immediately following significant weather events such as thunderstorms or spring run-off events.
- Number and height of erosional pedestals or terracettes:** None. There should be no evidence of pedestals or terracettes caused by accelerated water erosion. One to 2 inches of elevational mounding under Wyoming big sagebrush and other shrub canopies, and within biological soil crusts, is normal for this site and is not caused by water erosion. There are no exposed roots around perennial grasses and shrubs.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 30% - 45%. Soil surface may be covered by 15 to 50% gravels and/or channers. Bare ground openings should not be greater than 2 to 3 feet in diameter and should normally not be connected.

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5. **Number of gullies and erosion associated with gullies:** None at site level. Scattered landscape level gully channels, however, are a normal component of desert environments. Where landscape gullies are present, they should be stable, partially vegetated on their sides and bottoms, with no evidence of head-cutting. Some slight increase in disturbance may be evident following significant weather events or when gullies convey considerable runoff from higher elevation rocky or naturally eroding areas.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Very minor evidence of wind generated soil movement may be present. Slight depositional mounding within perennial grass crowns, under Wyoming big sagebrush and other shrub canopies, and within biological soil crusts is normal for this site.
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7. **Amount of litter movement (describe size and distance expected to travel):** The majority of litter accumulates in place at the base of plants canopies. Slight movement of the finest material (< 1/8 inch) may move 1 to 2 feet in the direction of prevailing winds or down slope if being transported by water. Little accumulation is observed behind obstructions.
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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):** This site should have a soil stability rating of 5 or 6 under plant canopies, and a 4 to 5 in the interspaces. Average should be a 5. Surface textures are typically gravelly loams, gravelly sandy loams, and sandy clay loams containing up to 50% coarse fragments.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** (Clapper) Soil surface is typically 0 to 3 inches deep. Surface texture is a gravelly loam and structure is weak thin platy parting to weak fine subangular blocky. The A-horizon color is brown (7.5YR 5/6). Soils have an Ochric epipedon that extends 3 inches into the soil profile. The A horizon is normally deeper and better developed under plant canopies.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Healthy stands of perennial grasses and shrubs, as well as the presence of biological crusts, provide for good infiltration, help break raindrop impact, and reduce runoff from storm events. Bare spaces are expected to be fairly small (< 3 feet) should be irregular in shape and usually not connected. Vegetative structure is adequate to capture snow and allow snowmelt to occur in a controlled manner.
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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. Soils are deep.
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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: Non-sprouting shrubs (Wyoming big sagebrush, bud sagebrush) >> Perennial bunchgrasses (Indian ricegrass, needle-and-thread) > Perennial forbs (scarlet globemallow).
- Sub-dominant: Sprouting shrubs (green rabbitbrush, winterfat) > = Warm season grasses (James galleta, blue grama).

Other: A wide variety of other grasses and both perennial and annual forbs can be expected to occur in the plant community.

Additional: Moss and lichen communities will normally be found under plant canopies while the cyanobacteria may be found throughout the site. Functional/structural groups may appropriately contain non-native species if their ecological function is the same as the native species. Perennial and annual forbs can be expected to vary widely in their expression in the plant community based upon departures from average growing conditions.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All age classes of perennial grasses should be present during years with average to above-average precipitation, there should be very little recent mortality or decadence apparent in either the shrubs or grasses. During severe (multi-year) drought or insect infestations up to 20% of the winterfat may die. There may be partial mortality of individual bunchgrasses and other shrubs during severe drought.

14. **Average percent litter cover (%) and depth (in):** Litter cover ranges from 15 to 20% with a small spike when bud sagebrush drops its leaves. Depth should be 1 leaf thickness in the interspaces and from 1/2 to 3/4 inches under perennial plant canopies.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production in air-dry herbage should be approximately 495 pounds per acre on an average year. Production could vary from 195 to 800 pounds per acre during drought or above-average years.

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:** Russian thistle, annual bromes and annual mustards are most likely to invade this site.

17. **Perennial plant reproductive capability:** All perennial plant species have the ability to reproduce in most years except drought years. There are no restrictions on either seed or vegetative reproduction. Some seedling recruitment of major species may be present during average or above average years.
