USDA Natural Resources
Conservation Service

Ecological site DX032X01A145
Saline Upland Sandy (SUS) Big Horn Basin Core

Last updated: 9/16/2020
Accessed: 05/07/2024

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)	Marji Patz
Contact for lead author	marji.patz@usda.gov, 307-271-3130
Date	04/16/2020
Approved by	Scott Woodall
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rare to non-existent. Where present, short and widely spaced.

2. **Presence of water flow patterns:** Barely observable.

3. **Number and height of erosional pedestals or terracettes:** Not evident on slopes less than 6%, but erosional pedestals will be present with terracettes at debris dams on slopes greater than 6%.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground will range from 25 to 45%, occurring as small openings between plants.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present, except in concentrated water flow pattern zones on steeper slopes (>20% slope).

6. **Extent of wind scoured, blowouts and/or depositional areas:** Minimal to non-existent.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter movement expected to move only small amounts (to leeward side of shrubs) due to wind. May see minor litter damming between shrubs on steeper slopes along water flow areas.

---

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability index ratings average at 3 in the interspaces, and 5 under plant canopy. Average values should be 3.0 or greater.

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Typically the surface is comprised of an A-Horizon of 1-4 inches (2-10 cm) with medium platy structure parting to granular structure and color hues of 10YR or 5Y, values of 5-7 and chromas of 2-4. Organic matter typically ranges from 0.5-2%.

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The evenly distributed, clustered plant community provides 30-60% foliar cover, with minimal basal footprint. The tendency for the surface to seal slows infiltration rates and results in slight to moderate runoff. The lack of basal cover (less than 5%) does little to effect runoff from this site.

---

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer exists, but some soil crusting in dry conditions is typical. The soil structure may appear platy in nature due to the dispersion of particles from salts in the soil. The caps of the natric horizon may be platy parting to granular structure, and could be mistaken as a compaction layer.

---

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: Low Growing Perennial Shrubs > Mid-stature Grasses

    Sub-dominant: Perennial Forbs

    Other: Short-stature Grasses

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal or very low incidence of decadence is expected, but minor loss is seen.

---

14. **Average percent litter cover (%) and depth (in):** Litter ranges from 5-15% of total canopy cover with the total litter (including beneath the plant canopy) from 15-35%. Herbaceous litter depth is typically shallow ranging from 2-7 mm. Woody litter depth ranges from from 0.1 to 0.25 of an inch (2-6 mm).

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** The average total above ground production on a normal year is 250 lbs./acre (kg/ha); ranging from 125 to

350 lbs/acre (kg/ha) in poor to 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:** Greasewood, sand dropseed, woolly plantain, low larkspur, native annual mustards and pepperweeds and a variety of other native annual forbs will invade the site as it degrades. Invasive species that are common include but are not limited to: halogeton, cheatgrass, and Russian thistle. For a current and more complete list consult the County and State Weed and Pest Noxious Weed List.

---

17. **Perennial plant reproductive capability:** All species are capable of reproducing, but are limited due to effective soil moisture and seed/soil contact. The lack of perennial canopy with the dispersal tendencies of the soil create a crusting effect from rain drop impact/wetting and drying of the soil. The weak structure of these soils are easily disturbed and provide areas for seeds to catch and germinate. Drought inhibits seed viability as well as reduces the root propagation potential.
