USDA Natural Resources
Conservation Service

Ecological site R046XN261MT
Very Shallow (VSw) RRU 46-N 15-19 PZ

Last updated: 7/19/2023
Accessed: 04/20/2024

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)	J Siddoway, R. Bandy, G. Petersen
Contact for lead author	grant.petersen@usda.gov
Date	04/19/2005
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Slopes most common on this site are between 0–45% and with only 70% of the soil surface covered, rills will occur in bare areas after moderate to extreme convection storms – rills in this case could potentially be rather numerous and greater than 10 feet in length.

2. **Presence of water flow patterns:** Will be evident on this site with the steeper slopes, and with areas of bare ground, there may be areas which show accumulations of litter due to water movement, even after minor storm events.

3. **Number and height of erosional pedestals or terracettes:** Wind erosion will be rare on this site, but water erosion on the steeper slopes may have plants that could have pedestals and terracettes which could be 0.5 inch in height at the top of the slope and 1.0 inch towards the bottom of the slope.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground will be approximately 30% on this site.

5. **Number of gullies and erosion associated with gullies:** Current gully erosion will not be evident on this site, but there may be gullies which have “healed” from the distant past.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Appearance or evidence of these erosional features or the landscape would be rare on this site.

---

7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement will be minimal on the gradual slopes, however on the steeper slopes there will be evidence of litter movement (i.e. debris dams) which may travel greater than 10 feet on steeper slopes.

---

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Resistance to erosion will be less than other ecological sites due to more bare ground. Areas within the site that are covered may have soil stability values of 4 to 5; areas of bare soil on this site may have values less than 3 if not under plant canopy.

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is blocky; A horizon depth is 1 – 2".

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Dominance of taller, deep rooted bunchgrasses will maximize infiltration and minimize runoff on most of the site, but areas with bare soil will have a higher potential for runoff and poorer infiltration rates.

---

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Will not be present generally, but there may be areas that have "healed" from former bison trails and wallows as well as more current livestock trails which could have a compaction layer below the soil surface.

---

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: Cool season, taller grasses (bluebunch wheatgrass)

    Sub-dominant: shrubs > cool season mid-grasses (Idaho fescue, needle and thread) = perennial forbs > cool season rhizomatous grasses (thickspike wheatgrass) = cool season short grasses (Sandberg bluegrass) = warm season bunchgrass (plains muhly)

    Other:

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Will be low for all functional groups in a given year. Prolonged droughts which last more than 3 years may show increases in mortality and decadence for all plant groups.

---

14. **Average percent litter cover (%) and depth (in):** Thin cover of litter is expected to be around 30 to 35%.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 800 - 1000 #/acre. This would be the expected production for the reference state during adequate moisture years. 950 pounds would be the expected production in a 17 inch precipitation zone.

---

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:** Dense clubmoss, skunkbush sumac, blue grama, Rocky Mountain juniper, red threeawn, field brome, a variety of annual or biennial weedy forbs, fringed/green sagewort, broom snakeweed, mountain big sagebrush, cheatgrass.

---

17. **Perennial plant reproductive capability:** During adequate moisture years bunchgrasses will generally produce seeds, however the cool season rhizomatous grasses may not necessarily produce seed even with adequate moisture.
