

Ecological site EX044B01A131 Shallow Clay (SwC) 10-14" PZ Frigid

Last updated: 2/11/2025
Accessed: 05/21/2025

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)	Grant Petersen
Contact for lead author	grant.petersen@usda.gov
Date	04/25/2019
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Rills will not be evident on lesser sloping Reference Communities. Steeper slopes (greater than 30%) may have rills particularly after extreme weather events however they will remain short
-
- 2. Presence of water flow patterns:** Water flow patterns will not be evident on lesser sloping Reference Communities however will likely be evident on slopes greater than 30% however they will be short.
-

3. **Number and height of erosional pedestals or terracettes:** Steep slopes (greater than 30%) may contain both pedestals and terracettes as a result of slow infiltration and higher run-off. Height of either will not exceed $\frac{3}{4}$ " tall.
-

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground in Reference State can be highly variable from 20-30%.
-

5. **Number of gullies and erosion associated with gullies:** Not present.
-

6. **Extent of wind scoured, blowouts and/or depositional areas:** Not Evident
-

7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement varies by slope class of the site as well as size of litter. In Reference, litter typically consists of perennial grass leaves and stems up less than 6-8 inches long and 0.25 inches in diameter. These types of litter tend to be resistant to movement on gentle slopes however may move up to 12 inches on steeper slopes as a result of extreme weather events.
-

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Site tends to remain relatively stable due to clay content. Stability values of 4-6 in interspaces and 5-6 under plant canopies/bases. A horizon is less than 2 inches thick
-

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Structure is medium to strong fine granular. A Horizon should be 2 inches thick with color, when wet, typically ranging in Value of 5 or less and Chroma of 3 or less. Local geology may affect color in which it is important to reference the Official Series Description (OSD) for characteristic range.
<https://soilseries.sc.egov.usda.gov/osdname.aspx>
-

10. **Effect of community phase composition (relative proportion of different functional**

groups) and spatial distribution on infiltration and runoff: Infiltration is naturally slow to clay content of soil. High proportions of deep rooted bunchgrasses combined with rhizomatous species between bunchgrasses optimized infiltration. Taproots of shrubs and forbs assist with infiltration. Plant spaces in a heterogenous pattern reduce runoff.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** A compaction layer is not present in the reference condition.
-

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: Mid-statured, perennial bunchgrasses

Sub-dominant: Rhizomatous grasses = shortgrasses/grasslikes > forbs ≥ shrubs ≥ subshrubs

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant mortality and decadence is rare on grasses and forbs. Some shrubs may express decadence in response to high snow load with slow infiltration on occasion.
-

14. **Average percent litter cover (%) and depth (in):** Total litter cover ranges from 35 to 45%. Most litter is irregularly distributed on the soil surface and is not at a measurable depth.
-

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Average annual production is 850. Low: 580 High 1030. Production varies based on effective precipitation and natural variability of soil properties for this ecological site.
-

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: Potential invasive (including noxious) species (native and non-native). Invasive species on this ecological site include (but not limited to) annual brome spp., spotted knapweed, yellow toadflax, ventenata, crested wheatgrass, etc.

Native species such as rocky mtn Juniper, ponderosa pine, Douglas fir, broom snakeweed, rabbitbrush spp., big sagebrush, blue grama, etc. when their populations are significant enough to affect ecological function, indicate site condition departure.

17. **Perennial plant reproductive capability:** In the reference condition, all plants are vigorous enough for reproduction either by seed or rhizomes in order to balance natural mortality with species recruitment.
-