

Ecological site R046XC602MT Dense Clay (DC) RRU 46-C 15-19 PZ

Last updated: 9/07/2023
Accessed: 05/13/2025

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)	G. Petersen
Contact for lead author	grant.petersen@usda.gov
Date	08/04/2020
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** Rills are expected after rainfall events and rapid snowmelt due to high bare ground percentage.
- Presence of water flow patterns:** Water flow patterns are common on this site due to high bare ground and very slow infiltration rate.
- Number and height of erosional pedestals or terracettes:** Pedestals and terracettes will exist on steeper slopes (greater than 5 percent). Height is less than 1 inch.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 45-50%. It consists of randomly scattered patches.
- Number of gullies and erosion associated with gullies:** Healed gullies may exist as a result of catastrophic rainfall events however current, active gully erosion will not be present.
- Extent of wind scoured, blowouts and/or depositional areas:** Wind scoured, or depositional areas are not evident in the reference condition.

-
7. **Amount of litter movement (describe size and distance expected to travel):** Due to the high amount of bare ground and potential connectivity between these bare patches, litter movement is expected to be high. Litter is primarily small leaves and stems travelling up to 10 feet.
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** The average soil stability rating is 3-4 under plant canopies and 1-3 in plant interspaces. Surface crusting may exist as a result of the high sodium content. The A horizon is less than 1 inch thick.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil Structure at the surface is platy to weak, fine subangular blocky. A Horizon will be less than 1 inch thick with color, when wet, typically ranging in Value of 6 or less and Chroma of 3 or less.
Local geology may affect color, 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 of the Dense Clay ecological site is very slow but is well drained. Infiltration is restricted due to high clay and sodium content of the soil. An even distribution of rhizomatous grasses (35-45%), mid stature bunchgrasses (30-40%), cool season shortgrasses (10-15%) along with forbs (3-5%), shrubs (5-10%) and warm season shortgrasses (1-3%)
-
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. Soil profile may contain an abrupt transition to an Argillic horizon which can be misinterpreted as compaction, however, the soil structure will be fine to medium subangular blocky, where a compaction layer will be platy or structureless (massive).
-
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: rhizomatous grasses (western wheatgrass) ≥ mid-statured, cool season, perennial bunchgrasses (green needlegrass, bluebunch wheatgrass)
- Sub-dominant: cool season shortgrasses/grasslikes (Sandberg bluegrass, Junegrass) ≥ shrubs > forbs > warm season shortgrasses
- Other:
- Additional:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Mortality in herbaceous species is not evident. Species with bunch growth forms may have some natural mortality in centers is 3% or less.
-

14. **Average percent litter cover (%) and depth (in):** Total litter cover ranges from 25-35%. 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 800 pounds per acre (896.7 kilograms per hectare).

Low: 500lbs/ac (560.4kg/ha)

High: 1050lbs/ac (1176.9kg/ha).

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, crested wheatgrass, pale alyssum, field pennycress (fanweed)

Native species such as broom snakeweed, Sandberg's bluegrass, blue grama, pricklypear cactus, greasewood, 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.
-