

Ecological site EX043B18I036 Droughty 19-24 inches precipitation zone Cryic Beaverhead Mountains

Last updated: 3/04/2024
Accessed: 05/03/2024

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)	Grant Petersen
Contact for lead author	grant.petersen@usda.gov 406-683-3804
Date	03/04/2021
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 exist under Reference State.

- 2. Presence of water flow patterns:** Water flow patterns will not exist under Reference State.

- 3. Number and height of erosional pedestals or terracettes:** Pedestals and terracettes will not exist under Reference State.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground will be less than 10 percent.

- 5. Number of gullies and erosion associated with gullies:** Gullies will not be present.

- 6. Extent of wind scoured, blowouts and/or depositional areas:** Wind scoured, blowouts, or depositional areas will not exist on this site under Reference State.

7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement is very limited on this site with herbaceous litter moving no more than 4 inches (10 centimeters) from its origin.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soils of this site are stable and should have Ratings of 3-6 using the Soil Stability Methods.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil structure at the surface is typically strong to medium fine granular. The A horizon should be 5-7 inches thick with color, when wet, typically ranging in Value of 3 or less and Chroma of 3 or less. Local geology may affect color, so it is important to reference the Official Series Description (OSD) for characteristic range

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Evenly distributed across the site, bunchgrasses improve infiltration while rhizomatous grasses protect the surface from runoff forces. The Droughty ecological site is well drained and has a moderate infiltration rate. An even distribution of grasses with totaling greater than 70 percent of site production, approximately 5 percent cool season rhizomatous grasses, 10 percent shortgrass and 55 percent deep rooted mid-statured bunchgrass. Forbs (15 percent), shrubs (15 percent), and trees (trace) account for the remaining percentage by weight.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Not present, some soils profiles may contain an abrupt transition to an argillic horizon which can be interpreted as compaction; however, the soil structure is typically subangular blocky whereas a compaction layer will tend to be structureless.

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 mid-statured bunchgrasses (bluebunch wheatgrass, Columbia needlegrass, Richardsons needlegrass, green needlegrass, spike fescue, rough fescue)

Sub-dominant: forbs = shrubs > cool-season short-grasses > rhizomatous grasses >> trees

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.

14. **Average percent litter cover (%) and depth (in):** Total litter cover ranges from 30-40 percent. Most litter is irregularly distributed on the soil surface and is typically less than 0.5 inches thick

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Average production is 1800 pounds per acre (lb/ac) or 2017 kilograms per hectare (kg/ha)
Low production is 1340 lb/ac or 1502kg/ha
High production is 2620 lbs/ac or 2937kg/ha

Production values can vary greatly due to site conditions and precipitation patterns. These values represent the Relative Value (RV) ranges for this site...outliers within the Reference State do exist

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:** dandelion (*Taraxicum* spp), cheatgrass (*Bromus tectorum*), field brome (*Bromus arvensis*), spotted knapweed (*Centaurea stoebe*), yellow toadflax (*Linaria vulgaris*), leafy spurge (*Euphorbia esula*), and Kentucky bluegrass (*Poa pratensis*)

Note: this list may not be fully comprehensive as unknown populations of weeds may exist

Native species with the ability to indicate degradation however species presence alone does not imply degradation:
Sandberg bluegrass (*Poa secunda*), big sagebrush (*Artemisia tridentata*), three-tip sagebrush (*Artemisia tripartita*), broom snakeweed (*Gutierrezia sarothrae*), rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), Rocky Mountain juniper (*Juniperus scopulorum*), Douglas fir (*Pseudotsuga menziesii*)

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. Density of plants indicates that plants reproduce at levels sufficient to fill available resource.
-